DESIGN BUILD PROJECT DELIVERY IN THE AIR FORCE RESERVE COMMAND

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DESIGN BUILD PROJECT DELIVERY IN THE AIR FORCE RESERVE COMMAND

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LIST OF ABBREVIATIONS

ACC	Air Combat Command
ACES	Automated Civil Engineer System
A/E	Architect/Engineer
AETC	Air Education and Training Command
AF	Air Force
AFCEE	Air Force Center for Engineering and Environment
AFCESA	Air Force Civil Engineer Support Agency
AFRC	Air Force Reserve Command
AF332	Base Civil Engineering Work Request
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AMC	Air Mobility Command
BES	Budget Estimate Submission
BOD	Beneficial Occupancy Date
BRAC	Base Realignment and Closure
CCD	Customer Concept Documents
CCL	Construction Cost Limit
COE	Corps of Engineer (All COE refers to AFRC's Corp District of Choice in Louisville, Kentucky
CSN AWD	Construction Award
DD1391	Department of Defense Military Construction Project Data (project program document)

DFAR	Defense Federal Acquisition Regulation
DI	Design Instruction
DOD	Department of Defense
FOA	Field Operating Agency
FUB	Facility Utilization Board
FY	Fiscal Year
MATOC	Multiple Award Task Order Contract
MILCON	Military Construction
NAVFAC	Naval Facilities Engineering Command
NTP	Notice to Proceed
O&M	Operation and Maintenance
OMB	Office Management Budget
PA	Programmed Amount
PB	President's Budget
PACAF	Air Force Pacific Command
PD	Project Definition
PI	Planning Instruction
PMO	Project Management Office
PMP	Program Management Plan
POM	Program Objective Memorandum
RFP	Request for Proposal
RTA	Ready to Advertise
SBA	Small Business Administration

SDB	Small Disadvantaged Business
SIOH	Supervision, Inspection and Overhead
USACE	United States Army Corp of Engineers
USAFE	Air Force Europe Command

SUMMARY

Design Build is rapidly becoming one of the most commonly used project delivery methods in the construction industry. The United States Corp of Engineers (USACE) has started implementing its own version of Design Build with the introduction of Military Transformation in April 2005. Per the Department of the Army (2008) Military Transformation is a term employed by the Corps to implement the use of alternate project delivery method as a means of achieving best value. The United States Air Force (AF) and the Air Force Reserve Command (AFRC) are expected to establish a target of 75% of all future Military Construction Projects (MILCONs) executed when using the Design Build method. The use of this delivery method results in significant changes to the relationships between the various parties associated with facility project delivery compared to the traditional Design Bid Build method. AFRC construction project procedures and requirements must also change.

Keywords: Design Build, MILCON Transformation, Project Delivery

CHAPTER 1

INTRODUCTION

The purpose of this thesis is to demonstrate how Design Build is currently used in AFRC and to examine problems that hinder their successful use of the Design Build delivery method and recommended improvements to existing Design Build methodologies. The data reflected is limited to that of AFRC MILCON projects only and no other government agencies were reviewed for comparisons. Eighty-seven facility projects in program years 1997-2006 constructed using both traditional Design Bid Build and Design Build delivery methods are examined. Parameters used for comparisons are: construction cost, schedule growth, cost growth, project dollar value, number and cost of modifications. The Air Force Automated Civil Engineering System (ACES) project management database is the instrument used to obtain and examine statistics for the various projects. Results from this thesis reveal significant issues with cost and schedule growth for AFRC facility Design Build projects. Practical implications of this thesis are related to demonstrating with the data where the weaknesses occur and recommend solutions that can be applied to future AFRC projects execution using the Design Build delivery method.

BACKGROUND

Design Build is a method of project delivery in which one entity forges a single contract with the owner to provide architectural/engineering design and construction services (Webster 1997; Allen 2001). The Design Build Institute of America defines Design Build "as an integrated project delivery where the Design Builder forges a single contract with the owner to provide absolute accountability for design and construction (DBIA.org 2009). This delivery method is not a new concept. Its roots originated from

the “Master Builder” concept where the responsibility for the design and construction resided with a single person. Design Build can be traced to ancient Mesopotamia; and the Code of Hammurabi (1800 BC) where complete accountability for both design and construction was with the master builders. The great temples, public buildings and aqueducts of Greece as well as the Parthenon and Dionysius Theater were all designed and built by master builders (An Introduction to DB, DBIA 1994). It was not until the renaissance era that the complexity of projects caused architecture and construction to evolve into separate and distinct professions. (Twomey 1989).

During the 1800’s the separation of design and construction evolved from functional to legal with the development of statutory and case laws. Courts began to rule that architects would only be liable for negligence of design and contractors would have strict liabilities in construction. The traditional Design Bid Build delivery method emerged as the primary choice. (Natkin 1994). It was not until the inflation of 1970’s and the litigious 1980’s that owners began to re-think the traditional Design Bid Build delivery method for construction projects. Design Build re-emerged as a viable delivery method along with some new methods such as Turnkey and Construction Management at Risk (Songer/Molenaar 1997). The resurgence of the Design Build delivery method is twofold. There has been an increased entry into the market place of both architects-engineers and contractors (Rosenbaum, 1995). Secondly, many owners are selecting Design Build for the first time (Denning, 1992) Informed owners are now asking the Design Builders to take “more than simply means and methods” interest in their buildings as well as the possibility of reduced construction cost. Today’s Design Build delivery method offers reassurance that the Design Builder offers full accountability for

architecture, engineering and construction (DBIA. Org, 2009). Design Build provides by a singular source for comprehensive services.

Design Build in the private sector is an appropriate delivery method for fast tracking a project. The term "fast-track" refers to "to any project or process in which there is overlap between two or more project phases" (DBIA, 2004).The designer and contractor appears as the same entity at least from the owner's point of view. There should be no issues of communication between the two parties regarding a proper understanding of the other's intent. A significant amount of communication between the designer and contractor is face to face or verbal and not just in the preparation or distribution of drawings and specifications. This type of communication allows the contractor to start procurement and construction before the final documents have been completed. Plus, there are no cost consequences for accelerating the delivery process to the owner. The concept of combining the designer and the contractor into a single entity allows the owner to shift the risk of delayed completion of the project to the design builder.

While the private sector has been using Design Build for many years, military use of this alternate delivery method is still in its early stages. The Department of Defense (DOD) began employing Design Build since 1987, receiving authorization via the Military Construction Authorization Act of 1986. This congressional sanction limited DOD to a maximum number of three projects per year delivered by the Design Build method. In 1993, the National Defense Authorization Acts, Public Law 102-484, removed limits on the number of projects that could be executed using Design Build. The Air Force received permission to use Design Build as a delivery method by the Secretary

of the Air Force in 1995. This permission came with strict limitations and guidelines regarding the types of projects that could be considered as candidates for this non-traditional delivery method. The choice to use Design Build now should be based on its merits for each individual project in the Air Force MILCON program. (NSPE, 1995) Figure 1 below shows and organization chart of the Department of Defense and the Air Force Reserve Commands place within the department structure.

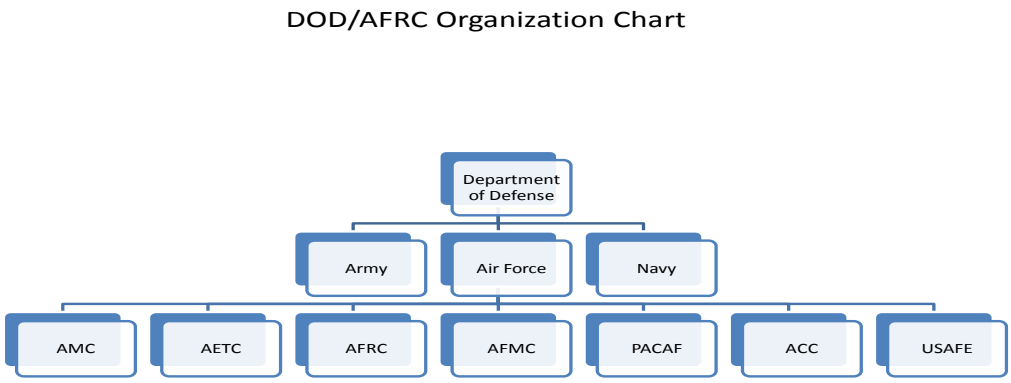

Figure 1. DOD Organization Chart

Prior to 1939 government employees typically performed all architectural and engineering (A/E) services on federal projects such as industrial plants, hospitals, office building and lodging. However in 1939, Public Law No. 76-43, directed federal agencies to contract with private firms to accomplish a portion of this function. This statue enabled government managers to recognize the private sector's expertise, innovative abilities and realize aesthetic, functionality and safety improvements in their facility designs. A numbers of factors contribute to the increased use of the Design-Build delivery method within the Air Force (AF) and the Air Force Reserve Command (AFRC). (AF Project

Manager Guide, 2007)

- Acquired the facility in a timely manner
- Reduced design cost paid with planning and design funds
- Reduced design changes
- Reduced construction modifications
- Reduced Government liability
- Supported corporate goals for on-time and with-in budget performance
- Reduced the Governments contract administration burden

CHAPTER 2

OBJECTIVES

DESIGN BUILD DRIVERS

Two external factors that drive the need for Design-Build in AFRC are the diminishing supply of MILCON design funds as shown in Figure 2 and the increased number of MILCON projects congressionally inserted into the Air Force programs each year.

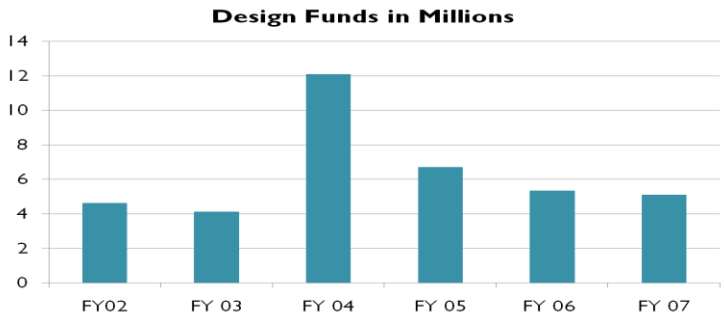

Figure 2. FY02-07 Five Year Design Funds

MILCON's are Military Construction projects that are line item approved by Congress at a specific monetary or programmed amount. The authorized sums are established based upon historical data for projects of similar scope and functional use classifications. Frequently, the traditional Design Bid Build delivery method employed by the United States Army Corps of Engineers (USACE), the design and construction agent for the Air Force is not a feasible project delivery option. The dollars are simply not available to pay

for a complete design prior to construction award. Air Force Reserve Command (AFRC), like most AF Commands, has to address the peculiar execution issues associated with congressionally inserted projects. These projects are "pulled" by congressmen/women from the future year of each Command's Five Year Defense Plan (FYDP) and "inserted" for construction award into the current fiscal year. This produces abrupt changes in the project planning process, describe in Figure 3 and compels serious consideration of Design Build procurement as the most expeditious means of accomplishing a construction award in the fiscal year of project appropriation. The aspiration to achieve award in the year project funds are appropriated is a politically prudent objective.

It is reasonable to ask why the federal government and in general DOD and AFRC have been slow to implement Design Build as an alternate delivery method for construction services. The reasons are copious but the most often cited one is the restrictive language of the Federal Acquisition Regulations (FAR): "No contract for the construction of a project shall be awarded to the firm, its subsidiaries or affiliates, which designed the project except with the approval of the government agency or authorized representative." (FAR-Section 36.209) It is in this statement that the FAR discourages utilization of Design Build project delivery. The allusion to Design Build as a delivery method is found in Subpart 36.3 Two Phase Design Build Selection Procedures (FAR 2005). No other clauses address the unique contracting roles and responsibilities of the typical Design Build contractual parties. The lack of regulatory contractual guidance dampens government agency enthusiasm for this alternative delivery method.

Additionally, the Two Phase selection method described in the FAR is cumbersome and time consuming. It is basically a procedure used to short list the number

of bidders eligible for award consideration to a maximum of five highly qualified firms. Each offeror is initially screened for compliance with a series of prerequisite criteria. The Two Phase Design Build selection process was instituted in 1992 as a result of sixteen proposals for an Army MILCON project. Each proposal received a series of evaluations that proceeded to best and final offers. The unsuccessful firms protested to Congress that if they had known the number of competitors they were competing against they would not have spent the extra funds required to develop and refine their initial proposals faced with such long odds of success in the final competition. (Hoffman, 2002)

Other reasons for the reluctance to use Design Build project delivery is taking design cost out of the Programmed Amount (PA) on projects less than $5M has a large impact on the availability of construction dollars. Also the preponderance of small business and small disadvantage business firms encouraged to participate in the DOD construction program process. These firms frequently lack the expertise and experience to efficiently execute facility project construction using processes other than traditional methods in which bid proposals are based upon fully designed scopes of work. Secondly the Design Build method shifts a significant amount of risk from the owner to the general contractor. This phenomenon is especially pertinent to small (less than $5M) projects and those with less complicated requirements. Currently the primary Air Force Reserve Design Build project delivery option is the Multiple Award Task Order Contract (MATOC). MATOC's are pools of pre-qualified contractors, already under contract to USACE to deliver broadly specified construction services according to specific technical and contractual standards. Each contractor is asked to submit a proposal to perform an individual construction projects. Typically each MATOC contractor pool is comprised of

firms qualifying as small disadvantaged business (SDB) as defined by the federal Small Business Administration. The United States Code (10 U.S.C. § 2323) set constitutional goals for SDB that "5% of federal defense contracting dollars for each fiscal year would be awarded to certain entities including small business concerns owned and controlled by socially and economically disadvantaged individuals". (Chierichella/Shirk, 2008)
Air Force Reserve Command projects are particularly targeted to meet Small Disadvantage Business (SDB) execution goals since these projects tend to be less complicated and of a lower dollar value when compared to those of other USACE military customers. Small, disadvantaged contractors are learning to be competitive in the construction contract profession; alternative project delivery methods can be an additional challenge for them.

DESIGN BUILD SPECIFICATIONS

The proclivity of AFRC customers to desire prescriptive specifications present yet another challenge to Design Build project delivery for this Command. Prescriptive specifications are a means and method of construction and composition and can lead to higher cost. Command client's approach the initial project definition meeting with a strong desire to incorporate their requirements in intricate detail often obscuring preferred and must have essential features. This scenario can be quite confusing and a bit intimidating to the technical design team with limited military experience.
Communicating to customers the prospect that there may be more than one technical scheme that will meet their mission's functional facility necessities can be a delicate matter. This objective can be accomplish with the use of performance based specifications. Performance based specifications are a set of instructions that outline the

functional requirements. They should be clearly written with achievable, measurable and enforceable instructions. A proposition to the client to allow Design Build contractor some leeway in meeting these requirements in the most prudent technical manner may be met with skepticism. The desire for dictatorial specifications that "have worked in the past" impinges with military transformation objective to convert to construction specifications base upon the more widely used and understood public industry standards. Present military construction standards are routinely intimidating and ambiguous and provide a formidable challenge for designers and contractors attempting to work with them.

PROJECT PROGRESSION

AFRC has lagged in adoption of the non-traditional Design Build delivery method for facility construction compared to most DOD commands. Yet, in order to keep up with mission demand and military transformation goals, Design Build must become a viable alternative to the long established Design Bid Build project delivery. Below are two current Air Force flow charts for MILCON's procedures. One illustrates the typical MILCON execution process from conceptual planning through Congressional notification and issuance of a field design instruction to the construction agency (COE). The other shows the way in which Design Bid Build or Design Build projects are expected to advance through award and construction.

In Figure 3 the flowchart show how projects begin at the Base level where the requirements are identified, a draft Military Construction Project Data (DD 1391) are started, and the Environmental Impact Analysis Process (EIAP) is completed The next step in the process is the Major Command of that base to execute Customer Concept

Documents (CCD) with Field Operating Agency (FOA) support, submit the final DD1391, MAJCOM requests project approval, Air Staff (A7C) obtains Congressional approval and then issues planning instructions (PI) to the FOA. The FOA will manage the funds review the CCD and 1391; assign a Design Manager or Construction Manager (DM/CM) for execution of the project, ensure architectural compatibility and functional adequacy for the base, and manage information flow to and from the MAJCOM as well as, conduct Project Management Reviews (PMR). Air Staff authorized the release of construction funds and the FOA issues Design Instructions to the agent. Construction funds are issued by the Secretary of the Air Force (SAF) directly to the agent. Once funds are received by the agent they can then enter into contracts with the Design Builder. The agent for the duration of the project will manage the contracts and ensure technical accuracy of the documents.

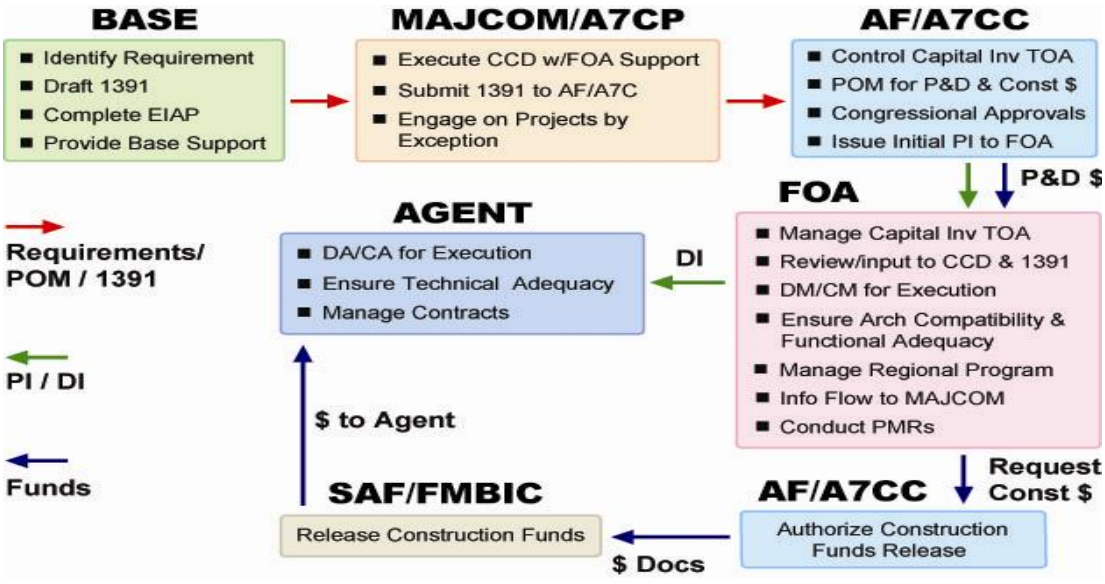

Figure 3. AFRC MILCON Flowchart, (AFCEE.mil 2008)

Figure 4 represents a diagram for both Design Bid Build and Design Build MILCON project delivery process prototype. This method initiates with an Acquisition Strategy

Meeting. The decision to use Design Build as a delivery method occurs as early as possible in the project development process, usually at the CCD stage. The delivery method would establish an execution process as visualized below. Figure 3 showed in detail how a project begins and is awarded. Figure 4 continues that process into construction. The diagram show a side by side comparison of both the traditional and Design Build methods. Both projects utilize the Project Definition Charrettes, however Design Build projects develop Request for Qualifications (RFQ), which is a means of short listing proposers who then respond on the Request for Proposals (RFP) instead of full fledge designs as required by the traditional Design Bid Build method. Further once the proposals for the Design Build projects are evaluated; the award time can be shorter than Design Bid Build projects. The shorter award time should equate to a faster project completion time.

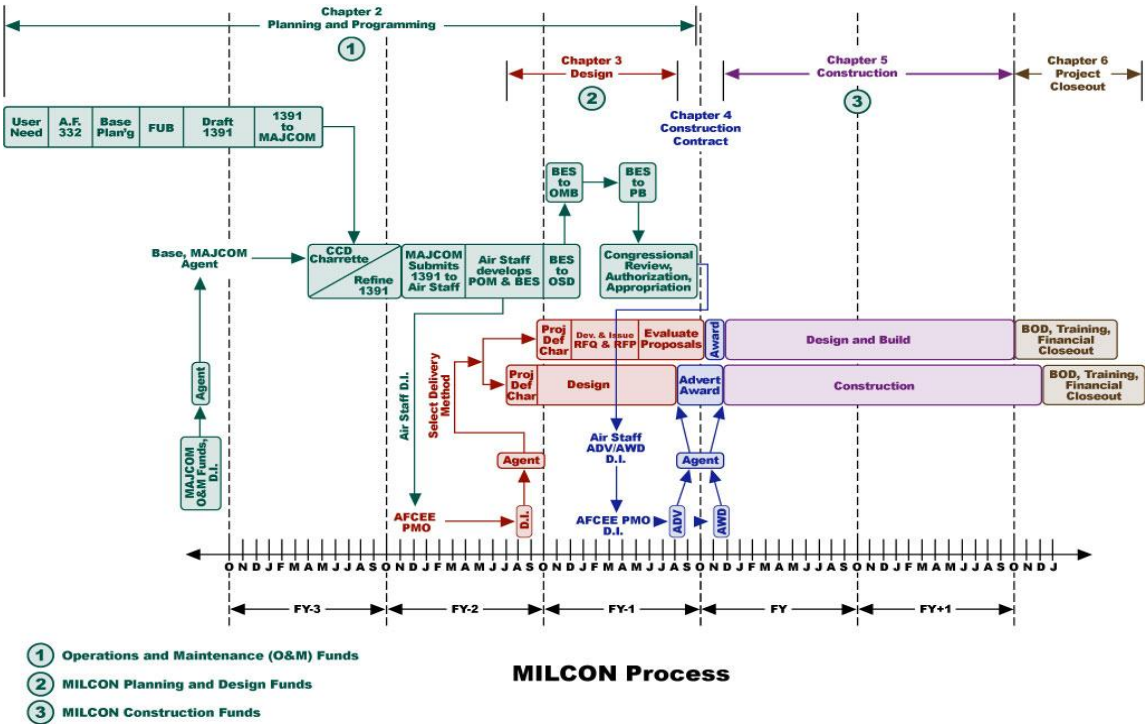

Figure 4. MILCON Project Delivery Process, (AFCEE.mil 2009)

RFP PREPARATION

RFP preparation requires that a well written statement of work be provided to the anticipated Design Build bridging Architect/Engineer (A/E) with sufficient information, defined parameters, to prepare and cost an offer for a Request for Proposal (RFP). A Pre-Definition conference is conducted. Attendees at this meeting include representatives from AFRC, COE, customer (facility occupant) and the installation's technical staff such as: Fire Department, Security Forces, Wing Safety, Environmental and Communications. At the conclusion of the meeting, and upon subsequent resolution of all questions and concerns, contract negotiations are conducted. A contract for professional A/E services is awarded at the successful completion of contractual discussions. The COE will then issue a Notice to Proceed (NTP) to the bridging A/E to accomplish the RFP. The fundamentally crucial component of the Design Build method is the RFP. Preparation of these documents typically begins with a face to face meeting of all parties: AFRC, COE, installation technical staff and pertinent customers. The Air Force uses the expression "charette" to describe this gathering. The term refers to a period, generally one week or less, of intense design exercise characterized by brainstorming and the development of concept design solutions based upon performance requirements contributed by the influential participants. RFP development generally proceeds with three A/E submissions, 15%, draft RFP and Final RFP all with subsequent reviews by AFRC Project Manager, Corp of Engineer's in-house staff, and Base Civil Engineering staff. When comments and corrections to all requirements have been incorporated into the document along with a realistic and satisfactory (within budget) construction cost estimate, the RFP is declared to be a final document acceptable to all entities. The COE

and AFRC will then prepare a source selection plan; public announcement is made through various types of media, the most common is FED BIZ OPS and finally the RFP is issued for solicitation for construction proposals. Once the proposals are received back to the COE a source selection is conducted to validate which proposal meets the requirement set forth in the RFP.

CHAPTER 3

METHODOLGY

All project related information for this thesis was obtained by the Automated Civil Engineer System (ACES). The formal definition of the ACES database "is a web-based database to support the DoD Business Enterprise Priority (BEP) of Real Property Accountability (RPA) by meeting Business Enterprise Architecture (BEA) requirements to implement Real Property Inventory Requirements (RPIR) and then subsequently the Real Property Acceptance Requirements (RPAR) and Construction in Progress Requirements (CIPR)". (Defenselink.mil website) The Air Force Project Managers input and track construction information from planning to final closeout using this database. The database allows you to filter projects by Command therefore for this thesis all AFRC vertical MILCON projects from 1997 to 2007 were extracted. Figure 5 show a brief example of how the information is translated by the reports.

AFRC MILCON CONSTRUCTION SCHEDULE & COST GROWTH 1997- 2007

Program Avenue: MCP

FY	Project Title	PA	Act Awd Date	Dsn Met	Est Cns Compl Dt	Act Cns Compl Dt	Orig Contr Amt	Cur Contract Amt	% Cst Incr	Mod Day	Ctr Day	% SCH Incr	# Mod
97	BC- PARARESCURE TRAINING FAC	$2,650,000	30-Sep-97	T	5-May-99	24-Jul-99	$3,027,437	$3,074,656	1.6	80	365	21.9	7
	BC-ALTER FOUR MISC SHOPS	$500,000	19-Sep-97	T	30-Apr-99	19-Jun-99	$320,000	$325,008	1.6	50	245	20.4	2
	BC-ALTER COMBAT CAMERA	$1,200,000	29-May-97	T	6-Feb-98	13-Mar-98	$494,442	$599,201	21.2	35	210	16.7	7
	FIRE TRAINING FACILITY	$2,500,000	30-Dec-96	T	26-Oct-97	18-Feb-99	$2,090,000	$2,106,133	0.8	780	300	260.0	1
	UPGRADE STORM DRAINAGE SYSTEM	$1,150,000	27-Sep-97	T	15-Sep-98	15-Oct-98	$773,000	$890,449	15.2	30	330	9.1	1
	WING HEADQUARTERS FACILITY	$5,300,000	30-Dec-96	T	15-Dec-98	28-May-98	$4,714,700	$4,714,700	0.0	0	540	0.0	0
	MEDICAL TRAINING/ADMIN	$2,300,000	12-May-97	T	22-Jun-98	18-Jun-98	$2,333,000	$2,347,174	0.6	0	360	0.0	2
	MEDICAL TRAINING FACILITY	$2,500,000	21-Mar-97	T	15-May-98	4-Jun-99	$2,011,750	$2,049,250	1.9	385	360	106.9	4
	IMPROVE STORM DRAINAGE SYSTEM	$950,000	30-Sep-97	T	15-Feb-99	30-Jun-99	$705,366	$705,366	0.0	135	300	45.0	0
	FUELS SYSTEMS MAINTENANCE HGR	$6,000,000	11-Mar-98	T	15-Jun-99	17-May-99	$6,100,000	$6,100,000	0.0	0	360	0.0	0
	FIRE TRAINING FACILITY	$1,500,000	30-Dec-96	T	2-Jul-98	18-Feb-99	$1,254,969	$1,254,969	0.0	231	300	77.0	1
	CONSOLIDATED MEDICAL TRAINING	$2,600,000	30-Sep-97	T	30-Dec-98	30-Dec-98	$2,401,027	$2,699,112	12.4	0	180	0.0	4
	CONSOLIDATED MAINTENANCE FAC	$3,600,000	12-Mar-97	T	24-Apr-98	29-May-98	$3,529,950	$3,529,950	0.0	35	360	9.7	0
	COMPOSITE MAINTENANCE FACILITY	$3,200,000	15-Nov-96	T	5-Mar-98	16-Jun-98	$2,877,859	$2,877,859	0.0	103	420	24.5	0
	BC-MUNITIONS STORAGE	$1,500,000	10-Jul-97	T	5-Jul-98	15-Oct-98	$1,192,379	$1,202,379	0.8	102	360	0.0	1
	AWACS MISSION	$3,400,000	1-Apr-97	T	15-Feb-98	29-May-98	$2,923,885	$2,923,885	0.0	103	285	36.1	0
	ADAL FACILITIES FOR CONVERSION	$5,700,000	16-Apr-97	T	14-May-98	6-May-99	$5,607,394	$5,607,394	0.0	357	365	97.8	0
	1997 Fiscal Year Total: $46,550,000 - 17 Projects						**(Averages)**		3.3			42.7	1.8
98	FIRE TRAINING FACILITY	$1,800,000	3-Aug-98	T	29-Jul-99	27-Apr-01	$1,546,434	$1,623,024	5.0	638	360	177.2	10
	CONSOLIDATED TRAINING FACILITY	$2,100,000	17-Sep-98	T	14-Jul-99	22-Jun-00	$1,479,650	$1,514,466	2.4	344	300	114.7	3
	RENOVATE BLDG 220 - HQ AFRES	$5,580,000	28-Sep-95	T	20-Jan-97	29-Mar-97	$6,331,000	$6,365,632	0.5	68	480	14.2	2
	CORROSION CONTROL FACILITY	$1,550,000	29-Jan-98	T	24-Apr-99	7-Apr-99	$1,530,198	$1,530,198	0.0	0	450	0	0
	BASE CIVIL ENGINEER COMPLEX	$8,913,000	20-Aug-98	DB	10-May-00	30-May-00	$7,928,100	$7,928,100	0.0	20	540	3.7	0
	ALTER MISCELLANEOUS MAINT FAC	$1,000,000	18-Dec-97	T	18-Dec-98	30-Dec-99	$842,000	$842,000	0.0	377	365	103.3	0
	AERIAL PORT TRAINING FACILTY	$4,200,000	17-Sep-98	T	3-Feb-00	13-Apr-01	$3,159,317	$3,159,317	0.0	435	415	104.8	0
	ADD/ALTER BASE SUPPLY	$2,800,000	18-Dec-97	T	15-Jun-99	15-Dec-99	$2,163,661	$2,163,661	0.0	183	365	50.1	0
	ADAL SQUAD OPS FACILITY	$1,400,000	18-Dec-97	T	15-Jun-99	30-Dec-99	$1,018,000	$1,018,000	0.0	183	365	50.1	0
	1998 Fiscal Year Total: $29,343,000 - 9 Projects						**(Averages)**		0.9			55.9	1.7
99	CONSOLIDATED MAINTENANCE FAC	$5,200,000	31-Mar-99	T	23-Feb-01	15-Jun-01	$4,396,000	$4,649,862	5.8	112	420	26.7	6
	RENOVATE VAQ 478	$4,600,000	1-Sep-99	T	21-Nov-00	21-Nov-00	$3,113,585	$3,113,585	0.0	0	390	0.0	0
	RENOVATE MAINTENANCE HANGAR 4	$5,200,000	19-Apr-99	T	12-Jun-00	5-Aug-03	$4,753,000	$4,753,000	0.0	1149	420	273.6	0
	PARARESCUE FACILITY	$1,400,000	28-Sep-00	T	23-Jul-01	20-Aug-01	$1,455,307	$1,455,307	0.0	28	270	10.3	0
	MUNITIONS HAND EQUIPT MAINT	$1,900,000	23-Jul-99	T	29-Nov-00	29-Nov-00	$1,688,354	$1,688,354	0.0	0	360	0.0	0
	CONSOLIDATED MEDICAL FACILITY	$3,400,000	27-Aug-99	T	23-Sep-00	23-Dec-01	$2,745,820	$2,920,920	6.4	456	360	126.7	17
	CONSOLIDATED MAINTENANCE FAC	$3,900,000	30-Jun-99	T	15-May-01	22-May-02	$3,031,400	$3,031,400	0.0	372	420	88.6	0
	CONSOLIDATED LODGING FAC PH 1	$3,236,000	11-Aug-99	T	1-Jun-01	5-Sep-01	$3,764,682	$3,764,682	0.0	96	540	17.8	0
	ALTER FAC FOR C-141 SIMULATOR	$1,600,000	25-Jan-99	T	10-Aug-99	3-Sep-99	$1,446,000	$1,521,911	5.2	24	180	13.3	14
	1999 Fiscal Year Total: $30,436,000 - 9 Projects						**(Averages)**		1.9			61.9	4.1

Figure 5. Typical Report from the ACES Database, (ACES 2008)

As you can see in Figure 5 the report shows how many projects were implemented during

each fiscal year, what project delivery was used, the programmed amount, award date, estimated completion date, actual dates in construction, and actual construction amount. From this information projects were broken out to see how many implemented the Design Bid Build versus the Design Build delivery method. Further information helps to show average cost, schedule growth and modifications for both the Design Bid Build and Design Build.

Milestone days are established by the Air Force DIRTKICKER project execution metrics. DIRTKICKER metrics are used to analyze MILCON execution and provide a fair and balanced approach for determination of the Air Force's best Commands in terms of the project delivery execution. The metric criteria embraces the full spectrum of engineering and construction management statistics related to cost schedule including design, construction, and financial closeout. The DIRTKICKER metrics for projects with values under the $5M are especially stringent. The construction contract timeline performance metric for these projects has a target of 365 days. The construction timeline for projects that are valued from $5M to $20M have target of 540 days. Extra points are assessed for the ability to award construction projects in early quarters of the fiscal year of congressional appropriation. DIRTKICKER metrics are the same for both Design Build and Design Bid Build projects. (AF PMP, 2007)

After reviewing all the MILCON projects between 1997 and 2006, projects cost for both Design Build and Design Bid Build projects ranged from $5M to $20M dollars. The target date for all projects was 540 days per the DIRTKICKER metric. Using the database data I calculated the number of days listed in the contract to the number of days in actual construction to determine schedule growth. Cost growth was determined

by award cost verses actual construction cost. Modifications were determined from the amount of days over the milestone plus the amount of money over the contract amount.

In an effort to better understand the Design Build in AFRC a questionnaire was distributed to all AFRC Program Managers, Corp of Engineer Program Managers, General Contractors, Navy Program Managers and Architect and Engineering firms to get feedback on the Design Build process currently being used by AFRC. The purpose of the questionnaire was to gain insight from individuals on what they thought of Design Build; is this method saving money and time; are there any disadvantages and if changes could be made what needs to change. In the next chapter you can see the results from the database report and questionnaire.

CHAPTER 4

RESULTS FROM

AFRC MILCON DATA FROM 1997-2006

Below are figures that show calculated cost and schedule growth data from the (ACES) database for Air Force Reserve Command (AFRC) projects over a ten year period (1997-2007). Only eighty-seven vertical facility projects were constructed over the ten year period. Figure 6 shows the percentage breakdown between Design Build and Design Bid Build project delivery methods from 1997-2007. AFRC implemented the Design Build delivery method in sixteen MILCON facility projects over the evaluated period. The majority of construction was still designed and constructed in the traditional Design Bid Build delivery method.

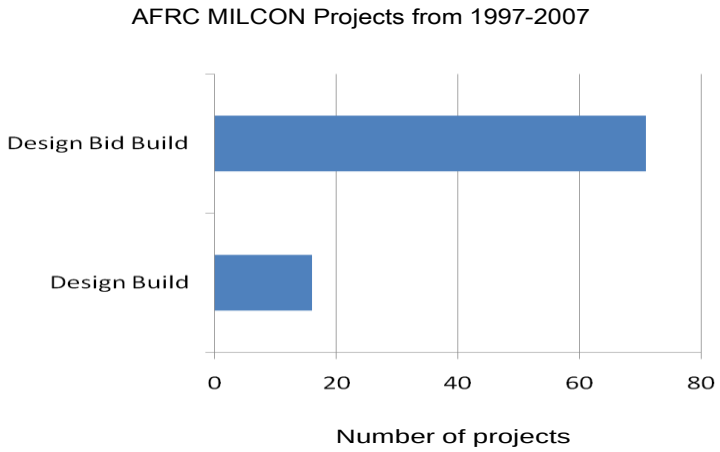

Figure 6. AFRC MILCON Projects from 1997-2007

AFRC was appropriated $360M in MILCON construction dollars from 1997-2007 as shown in Figure 7. Thirty percent of the appropriated MILCON money about $107M was used to fund Design Build projects and $252M was used to fund the traditional Design

Bid Build projects.

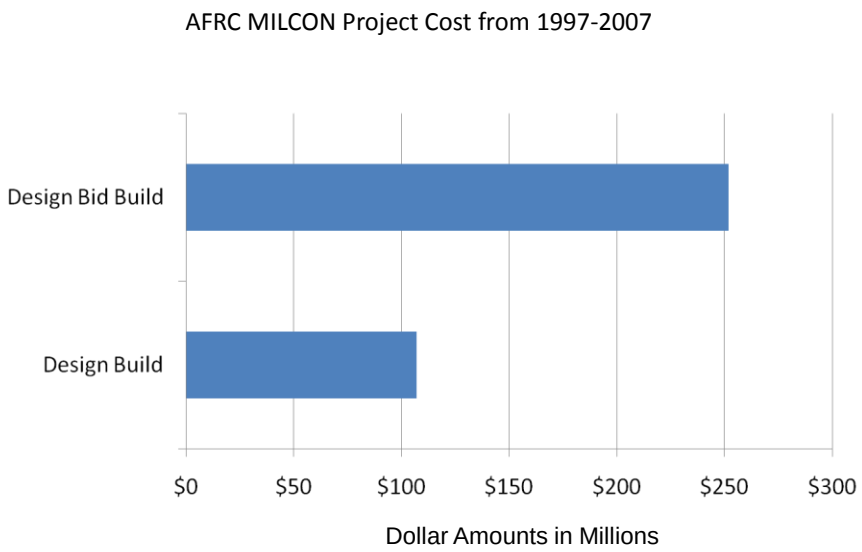

Figure 7. MILCON Cost from 1997-2007

Using the ACES database I was able to determine over the reviewed performance cycle how many modifications were executed for both delivery methods. Figure 8 shows that sixteen Design Build projects had a total of fifty-two modifications at a total cost of $266K. The remaining seventy-one projects used the traditional delivery method of Design-Bid-Build. The total modifications were 221 with a total cost of $341K.

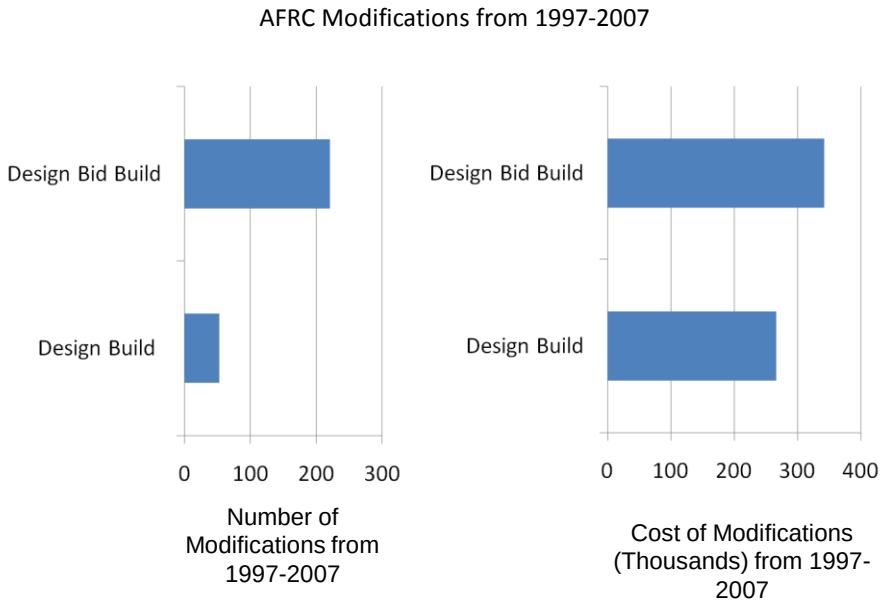

Figure 8. Number and Cost of Modifications

Both Design Bid Build and Design Build average the same amount of modifications per projects, with an average of three change orders per project. There is no tangible documentation at this time in the ACES database as to why modifications were needed. The difference is for Design Build project the average modification cost was approximately $5K. Conversely, Design Bid Build project modification cost averaged $1600. On vertical MILCON facilities AFRC spent an estimated three times more on Design Build project modifications than on the traditional Design Bid Build.

Figure 9 shows that cost growth on the Design Bid Build project is less than 1% while Design Build projects exhibited more than 2% cost growth. Cost growth differences between the two methods are significant Design Build cost growth is approximately 55% more (2.17% vs. .97%) compared to traditional Design Bid Build projects. This data refutes what AFRC is trying to accomplish with an alternative

delivery method. All Air Force comparisons literature asserts that Design Build cost growth on average is 5% less than Design Bid Build (AFCEE Website, 2003).

Six out of the sixteen MILCON projects completed using the Design Build delivery methods were award over the Programmed Amount (PA). The total monetary cost growth for the Design Build projects were $2,339,826.52. The other ten projects, awarded at or below the PA. Twenty-five of out of seventy-one total AFRC MILON projects completed using the Design Bid Build project delivery method were awarded over the PA by an amount totaling @ $2,545,866.34. The other forty-six projects were awarded at or below Programmed Amount (PA). Research data shows that Design Bid Build projects experienced only .97 % cost growth. Cost growth is due to a myriad of factors but the most significant and perhaps disturbing is AFRC's lack of understand of the Design Build delivery method. Figure 8 shows the cost growth of both Design Bid Build and Design Build projects between 1997-2006.

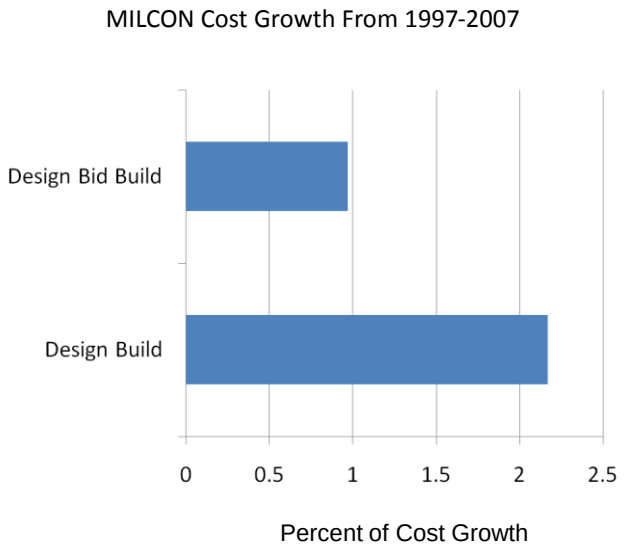

Figure 9. Cost Growth for MILCON Projects from 1997-2007

After reviewing all the MILCON projects for both Design Build and Design Bid Build the target DIRTKICER Metric for time in construction is 540 days. The Design Build projects had an average of 654 days in construction. The Design Bid Build projects that were within the same dollar amount had an average of 641 days in construction. Design Bid Build projects averaged 101 days over the DIRTKICKER milestone, while Design Build averaged 114 days over the milestone. Time growth for both project delivery methods is greater than the requirements to what the Air Force has established with it DIRTKICKER requirements. The Design Build projects over the study period had a total of 1150 days added to the contracts for modifications. That number can be translated to an estimated average of 72 modification days per project. Based on 3modifications per project Design Build projects average 24 days per modification. The Design Bid Build projects over the study period had a total 1917 days added to the contracts for modifications. This number can be translated to an average of 27 modification days per project and again averaging 3 modifications per project, each modification is approximately 9 days. This statistical analysis again shows that currently AFRC is unable to meet the Air Force goal of 11% faster construction time. (AFCEE website).

QUESTIONAIRE RESULTS MAY 2008-AUGUST 2008

The following figures show the documented survey results from individuals from Air Force Reserve Command, Corp of Engineers Louisville District, Design Build Contractors, Navy Program Managers and Architect and Engineering firms that has completed projects for the Air Force Reserve Command. The survey consisted of fourteen questions. (Appendix A) The purpose of the survey is to harness and reveal

relevant opinion data from individuals that have participated in execution of Design Build and Design Bid Build projects for AFRC and the views, opinions and knowledge on these delivery methods within the community of individual that practice construction execution on a daily basis.

Figure 10 shows survey participants' perception of the Design Build delivery method. Figure 10 also confirms that of the people surveyed most had an understanding of the Design Build delivery method. However, the Project Management Planning Guide Design Build definition adds that "the RFP includes the level of project definition necessary to clearly define the elements of the design that AFRC/AF wants to control" (AF MEMP, 2007). This definition mandates no technical design solution. The only design required, per this definition during the selection process is to establish the "cost of the project." A comparison of the opinions expressed in Figure 11 and the AF planning guide reveals a loss of the essence of Design Build in AF execution of this delivery method. Several individuals said that design build was a procurement method for constructing MILCON's that include both design and construction and several others didn't agree with any of the choices listed on the survey.

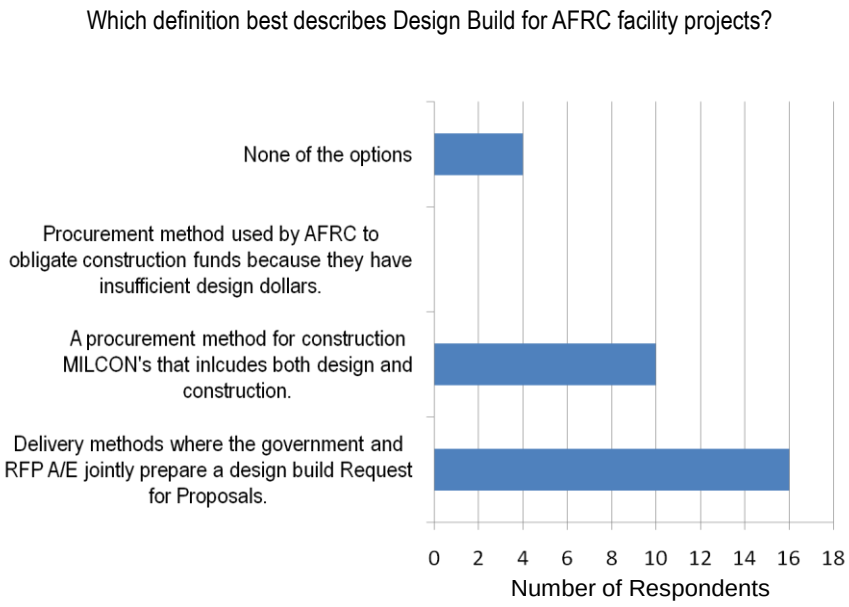

Figure 10. Question One from the Professional Questionnaire

Figure 11 questions "What is the main reason AFRC use the Design Build delivery method?" Revelations from this question was that the majority thought that AFRC chose the Design Build delivery method just to obligate money quickly instead, of selecting a delivery method for projects that would be most beneficial in cost for that project. Only a small percentage felt that Design Build provided a better savings and none of the respondents believed that AFRC projects disproportionally lent themselves to the Design Build delivery method versus the traditional method of Design Bid Build.

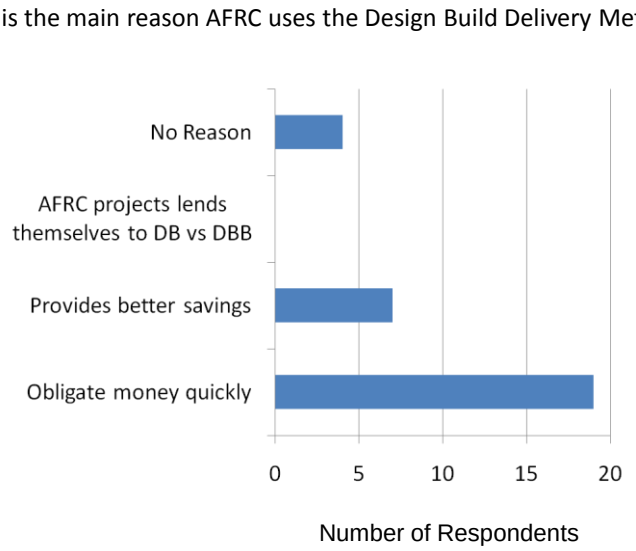

Figure 11. Question Two from the Professional Questionnaire

Respondents were also asked about the potential problems in the implementation of Design Build for AFRC, not having a clearly defined scope for the project has been a problem for AFRC ever since the Command began to use Design Build in 1995. Figure 12 details the top five issues that AFRC has in implementing the Design Build delivery method. Not having clear defined scope ranked number one. Due to lack of information AFRC PM's still push forward with projects without addressing these shortcomings in information availability. The questionnaire also revealed that respondents felt that having to use the Small Business Administration (SBA) contractor was problematic. The lack of user input and architectural base standard continue to provide resistance to an alternative method. Lack of money per many of the respondents can be attributed to lack of programming and congressional inserts but most recently has been caused by escalating steel and fuel cost. (AGC, June 2008). Additionally many areas

of the country have had natural disasters or economic booms that have raised construction prices in those areas. However, the DOD Pricing Guide (wbdg.org) does not include these factors in its pricing evaluation analysis. Building project budgets are fixed based upon the Pricing Guide of the applicable fiscal year.

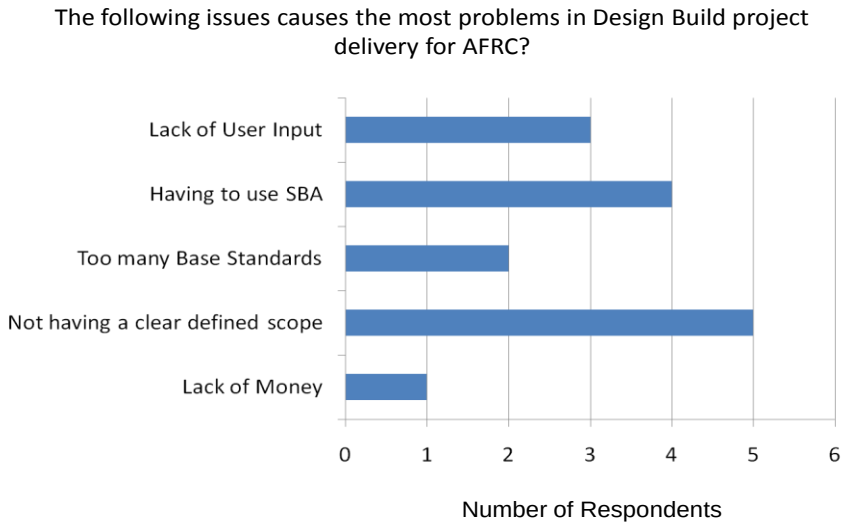

Figure 12. Question Three from the Professional Questionnaire

Fifty-three percent of the respondents agreed that user changes were the reason for most Design Build modifications. While forty-seven percent said that unforeseen site conditions were the reason. The questionnaire disclosed that most people overwhelmingly prefer the traditional Design Bid Build delivery method over the alternative method of Design Build. Again this can be traced back to the fact that from 1997- 2007 only eighteen percent of all facility MILCON projects used the alternative delivery method of Design Build. Figure 13 details which design method the respondents preferred. Eighty-eight percent of the survey respondents prefer the traditional delivery method of Design Bid Build while 12% favored the Design Build method.

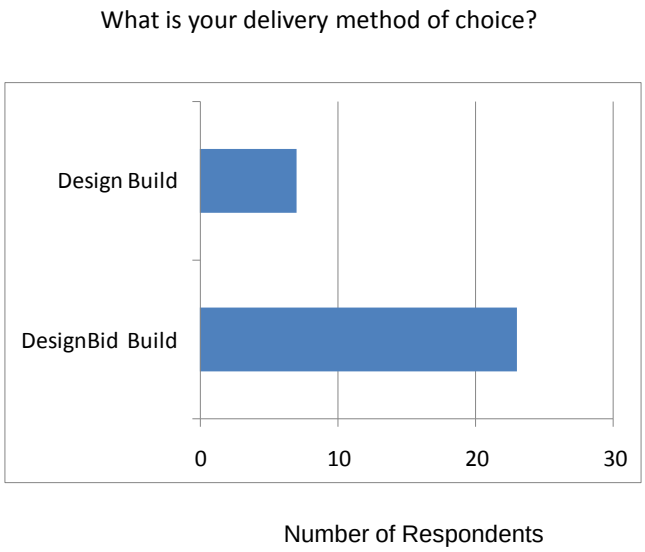

Figure 13. Question Five from the Professional Questionnaire

The questionnaire asked which benefits Design Build offered as an alternative delivery method to traditional Design Bid Build. Figure 14 shows that a faster schedule tops the list as the best benefit followed by collaboration. Both reduced litigation and contract modifications were number three and reduced administrative burden and reduced design time and cost tied at number four. According to the respondents, fixed price and lower cost does not offer any benefits as both were rated last. In the previous figure that asked why AFRC uses Design Build a faster schedule was not given as a response by the respondents.

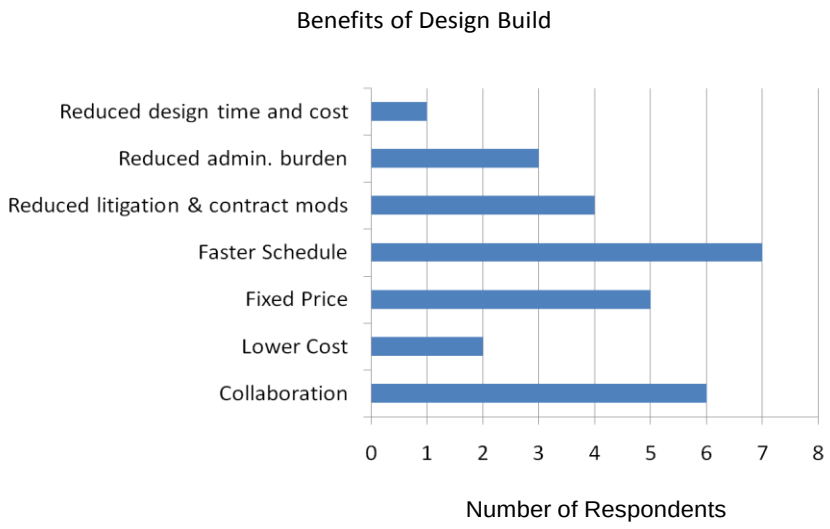

Figure 14. Question Six from the Professional Questionnaire

One of the key reasons that AFRC has had difficulty in implementation of the Design Build delivery method is clearly exhibited in Figure 15 where more than half of the respondents see Design Build as a fast-track version of Design Bid Build. In laymen terms even though Design Build is the chosen delivery method AFRC still requires a full 100% drawings and specification before the first shovel of dirt is moved on the project by the General Contractor.

Figure 15 shows that fifty nine percent said that even though a contract has been cut to one entity they still desire to design the facility fully before starting. Majority of the respondents said that AFRC does not implement Design Build in its true essence but yet see it as a fast-track version of Design Bid Build.

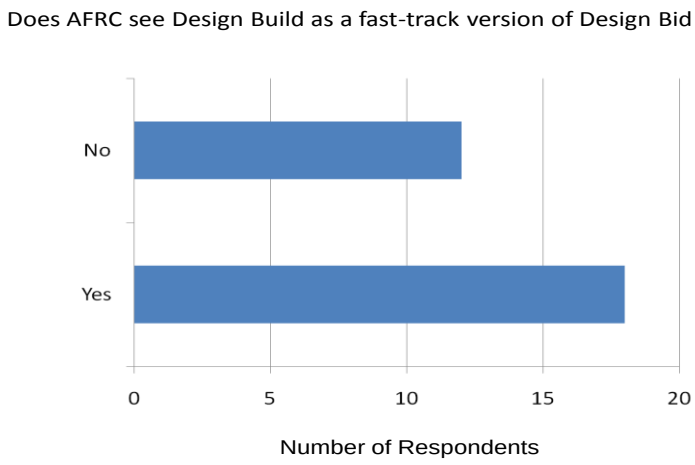

Figure 15. Question Seven from the Professional Questionnaire

The Multiple Task Order Contractors (MATOC) more commonly known as indefinite delivery/Indefinite quality (ID/IQ) contracts allow AFRC to acquire design and construction services within stated limits of an already established pool of contractors. A key reason for including this question in the survey is that, because a majority of AFRC projects have a budget below $10M dollars; they are prime candidates for offer to 8A contractors through the Small Business Administration. The 8A program is named for Section 8(a) of the Small Business Act. The purpose of the program is to foster business development for small disadvantaged business to compete in the market place. (SBA Guide, 2009) Many MATOC's are composed of these types of contractors. On a positive note most respondents did believe that MATOC contractors understood the Design Build delivery process as noted in Figure 16.

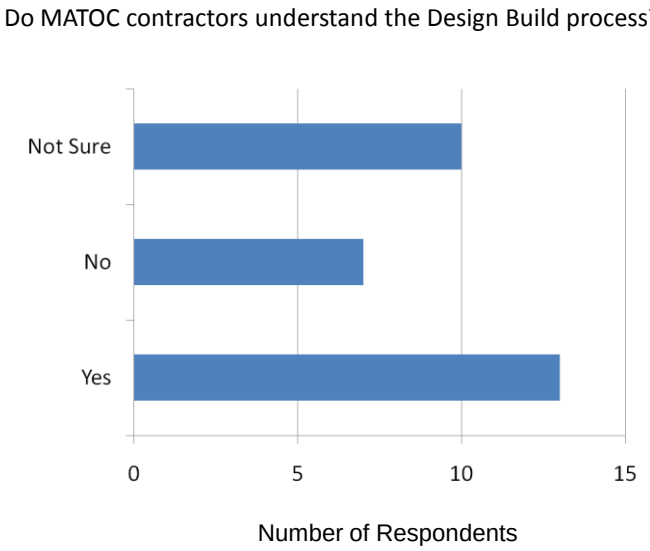

Figure 16. Question Eight from the Professional Questionnaire

Performance based specifications are not uncommon for Design Build projects both in the private and public arenas, however prescriptive based specifications are more common on public projects. The reason for this can be explained by the variety of requirements that are imposed by DOD and the Air Force. All projects must adhere to certain architectural compatibility standards established by the bases as well as requirements to meet Anti-Terrorist/ Force Protection requirements mandated by new security regulations. Certain facilities require specific communications and electrical requirements. These standards and rules impose demands to include some prescriptive specifications. Figure 17 shows that the respondents are split whether these prescriptive specifications discourage participation by the general contractor.

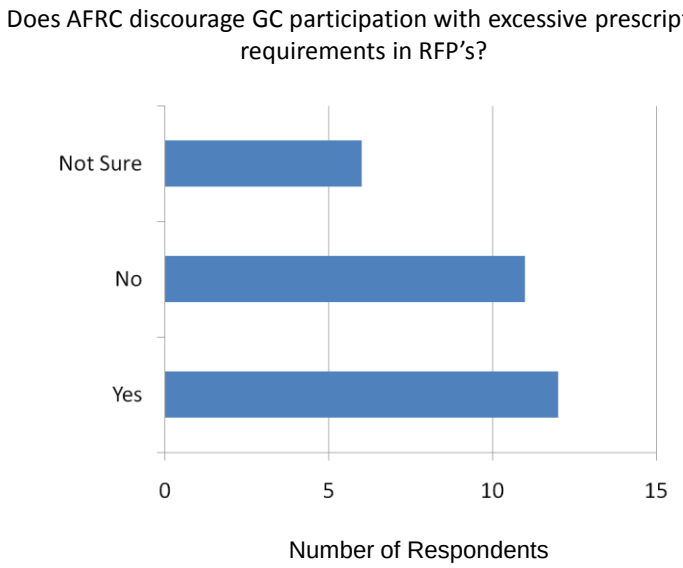

Figure 17. Question Nine from the Professional Questionnaire

From 1997-2007 AFRC Design Build projects averaged 130 days of schedule growth. (ACES Database). Questionnaire respondents overwhelming responded with their belief that schedule growth in days for Design Build projects was only 1 to 50 days over the set contract amount as shown in Figure 18. Only one respondent answered no additional days while less than five people responded in the 100 to 150 days.

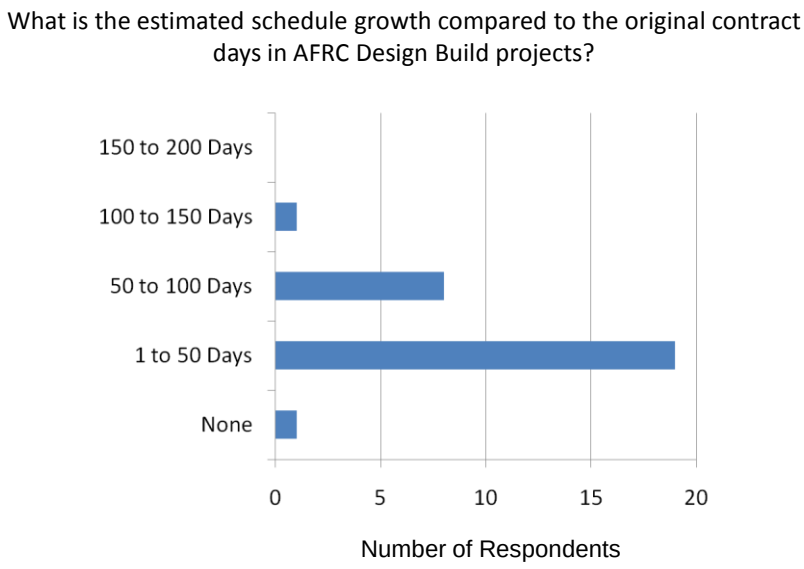

Figure 18. Question Nine from the Professional Questionnaire

According to Figure 19 Design Build projects averaged a 25% schedule growth time. This number is considerable lower than the schedule growth for Design Bid Build projects.

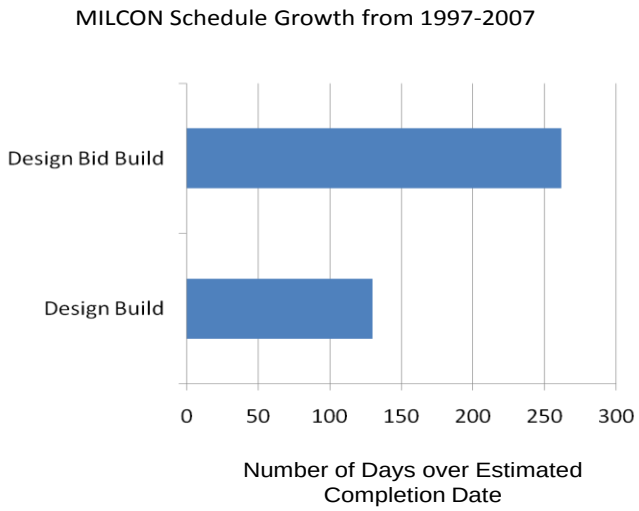

Figure 19. AFRC MILCON Schedule Growth from 1997-2007

Design Build remains a viable method to consider for fast-tracking projects to meet desired timeframes. Fifty-five percent (55%) of the schedule growth for Design Build Projects can be directly attributed to modifications to the projects whereas; Design Bid Build projects only experienced a ten percent (10%) schedule grow due to modifications in the project as shown in Figure 20.

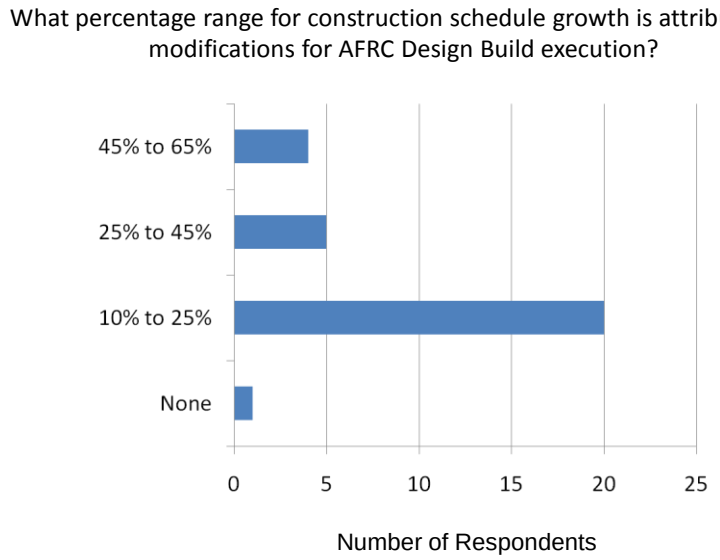

Figure 20. Question Twelve from the Professional Questionnaire

Figure 21 shows that a majority of the survey respondents are unaware of the schedule growth in Design Build projects due to the modifications.

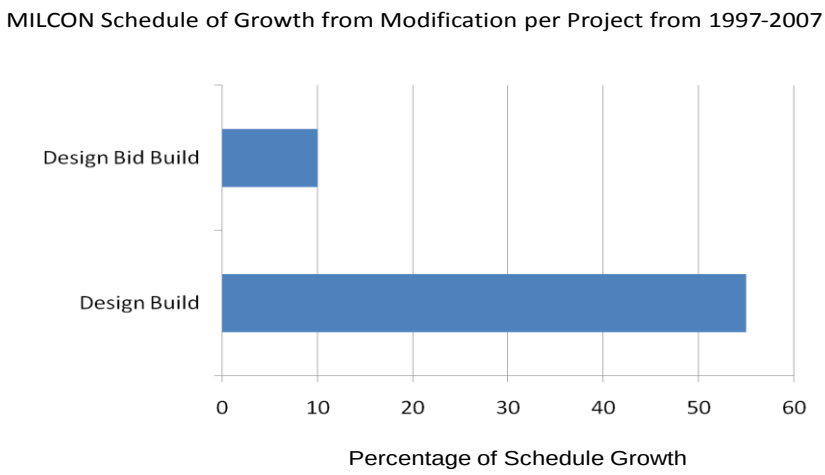

Figure 21. AFRC Percentage of Schedule Growth due to Modifications

From 1997-2007 Design Build projects experienced a total of fifty-three (53) modifications with a total cost of $267 thousand dollars above the appropriated amount. Design Bid Build projects had a total of two hundred and twenty-one (221) modifications over the study period for a total of $341 thousand dollars over the original appropriated amount. On average for vertical facility projects a single modification cost five thousand dollars on Design Build projects while Design Bid Build experienced the same number of modifications but at a much lower cost of sixteen hundred dollars per modification. AFRC spends on average thirty-four hundred dollars more on Design Build modifications. The respondents per Figure 12 stated that having a poorly defined Request for Proposals was the number one reason the AFRC has difficulty implementing the Design Build delivery method. When the RFP fails to completely and accurately incorporate the scope of work any changes made can be especially costly after award. It is imperative that the host base installation and users supply all of their requirements during the RFP preparation. User changes and unforeseen site conditions are the main

culprits for Design Build modifications. Again the need for user changes is a direct reflection of an unclear scope of work. Figure 22 below reflects respondent's estimate on the number of modifications per Design Build project. The information that can be taken from this data is that respondents indicated there would be changes and a large amount felt there would be significant modifications in the range of 7 to 10. This data indicated that most do not have confidence in using Design Build as an alternative delivery method.

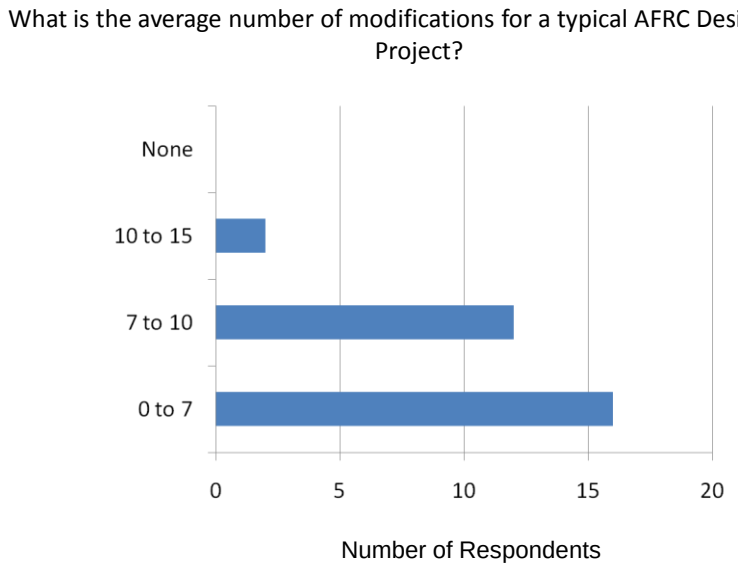

Figure 22. Question Ten from the Professional Questionnaire

There are still several issues such as modifications/change orders that continue to plague a true success in the Design Build arena for AFRC. Below in Figure 23 the questionnaire found that the most common modification or change order was due to user changes. This problem can be directly related to not having a clearly defined scope in the RFP prior to award.

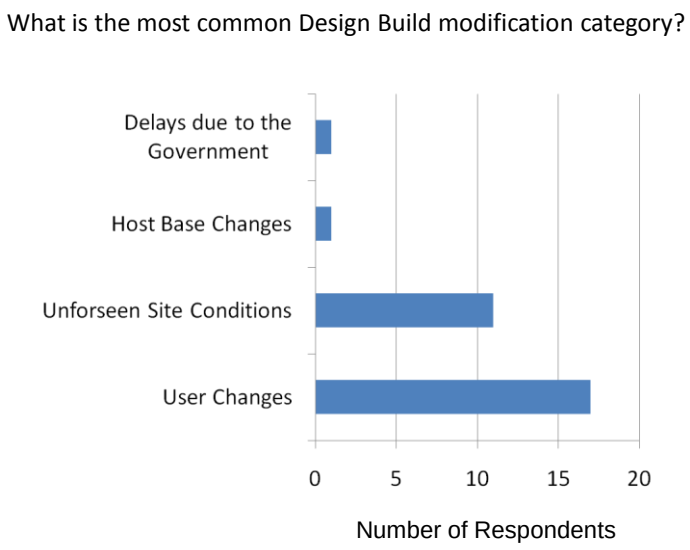

Figure 23. Question Four from the Professional Questionnaire

Since Design Build appears to offer so many benefits, is it reasonable to ask why this method is used so infrequently as an alternative to the more traditional Design Bid Build method in AFRC? While the private sector has seen a successful stream of advantages in the uses of Design Build such as:

- Early project completion an occupancy
- Excellent information interchange between design and construction personnel
- Ideal method of projects requiring construction phasing
- Contract for both design and construction (reduced paperwork)
- Contractor is responsible for construction changes that are the result of design deficiencies
- Projects can be “fast-tracked” because the schedule is controlled by one entity

Figure 14 shows the Design Build benefits according to the questionnaire are varied from reduced litigation, and collaboration, to a faster schedule. However the MILCON project

data in Figure 18 and below in Figure 24 shows that even though Design Build projects do finish quicker than the Design Bid Build projects; they are still on average completed 130 days after the set milestones that AFRC has established for all facility construction projects. Out of the additional 130 days 72 of those days are due to modifications to the contract which is 55% of the schedule growth. The Design Bid Build projects on average are about 262 days later than the set milestones however only 27 days are due to modifications to the contract which represents only 10% of the schedule growth.

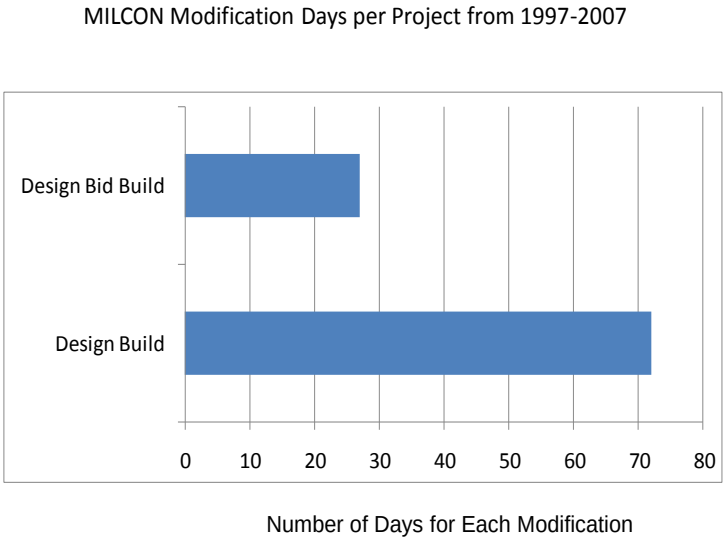

Figure 24. MILCON Days in Modifications

A further breakdown of the data to shows that both delivery methods average 3 modifications per project. Design Build project modifications average 22 additional days per modification where Design Bid Build projects average 9 days per modification. The benefits of Design Build in the private sector unfortunately don't always translate with the same advantages to DOD and especially AFRC. That is most evident in the fact that

many private sector clients that use the alternative delivery method have ongoing long term relationship with Design Build firms. This simpatico relationship is built on two fundamental needs collaboration and trust. Due to FAR requirements discussed earlier government agencies do not have the same privileges. In many instances AFRC will have different Design Build firms for each MILCON project. Therefore, it is difficult to build the trust relationship that is needed for successful projects.

There are several disadvantages to using Design Build within AFRC such as:

- Payment of upfront costs for RFP preparations can be perceived as "paying for the design twice".
- Loss of a significant degree of design and construction control
- When "low bid" or "fixed price" is the selection method, the amount of front end project program information is considerable.
- Unique execution challenges for small disadvantage contractors still learning to perform in the military construction environment.

All of the disadvantages cited above impede selection of Design Build project delivery as the execution method of choice. This could be the reason that AFRC has had numerous problems successfully implementing the Design Build delivery method. Not having a clearly define scope, is without a doubt the largest hurdle that has to be overcome followed closely by a lack of user input and having to use SBA contractors.

The data in the previous figures showed significant cost and schedule growth in Design Build project delivery related to relative comparison to the traditional delivery method of Design Bid Build. Again, many of those surveyed feel that the traditional method offers a

higher degree of control of the project as opposed to the Design Build delivery method. The last question from the survey was to see if anyone believed that Design Build delivery method offered construction cost savings to AFRC. As you can see in Figure 25 most of the respondents do not believe that using Design Build offers any cost construction savings.

It is apparent in Figure 25 that sixty-six of the respondents to the questionnaire don't think that the Design Build delivery method offers and construction cost savings.

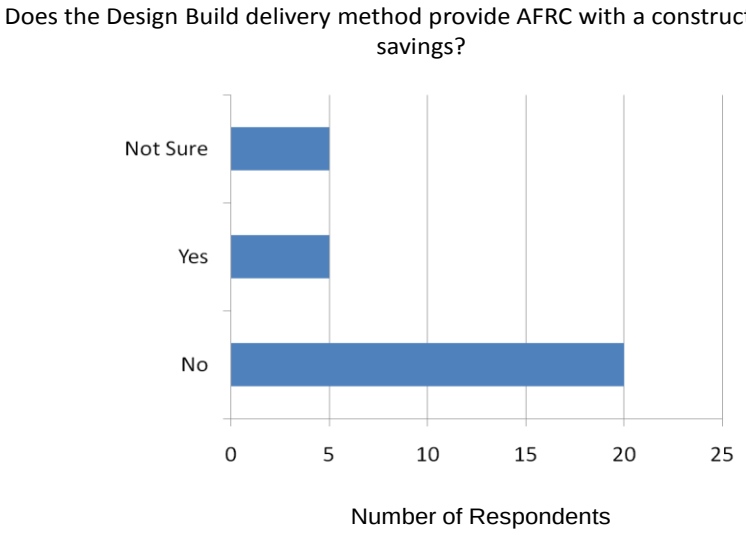

Figure 25. Question Thirteen from the Professional Questionnaire

AFRC has a history of procuring projects using the firm fixed price acquisition strategy. In Figure 12 not having a clear defined scope of work is a significant issue per the respondents. In Figure 23 the most common modification was user changes. It is understandable based of the respondents' answers to the questionnaire why AFRC Design Build projects have such difficulty remaining on time and within budget. In essence, the Command is asking the general contractor to give a firm fixed price response to a RFP that is lacking significant information. It is impossible for the Design Build

delivery method to be faster and less expensive under this type of circumstance.

Per all the data from ACES and the Questionnaire, Design Bid Build projects usually fair better in AFRC construction program because there are prescriptive specifications for the general contractor to follow in this delivery method. Design Build to the perception of many leaves too much room for interpretation by the contractor.

PROPOSED CHANGES

Per Question Fourteen from the questionnaire, respondents' were asked to comment on changes they would like to see made to the current AFRC Design Build methodology. Below is a compilation of responses received, if AFRC could implement many of suggestions below, it could see increased project execution success with the Design Build method.

- DD1391 program documents reflect the design cost. When this cost is not included on the program document the design cost is deducted from the overall programmed amount.
- Increase the delivery period and shorten the RFP preparation time and cost
- Treat the projects as true Design Build and not as a quick way to get something awarded that has no design. The AFRC bases will award something as Design Build and then expect the contractor to proceed with design to at least 90% with all the submittals and approvals required in a Design Bid Build. This defeats the purpose and doesn't allow flexibility to the contractor which is where cost savings can be achieved.
- Improve RFP, SOW development

- Use qualification base selection process, negotiate fee, and give government guarantee at the 65% design
- Selection of the General Contractor should be increasingly based more on team experience, past performance, project approach versus purely price. Issue a stipend for short listed teams.
- Administer the contract as Design Build and don't hold the DB contractor to the a same submittal requirement like it was a typical Design Bid Build.
- Encourage better preparation of the Design Build statement of work (including preparation of a 35% design package using A/E design) so that the project work scope is better defined resulting in receipt by the government a better end product for the dollars spent.
- Quicker response to user requested changes. Often user don't talk to the Corp or the Corp representative and get angry when they are not getting what they want.
- Programmed amounts are way too low and usually don't include the design cost which is around 10-20% of the construction cost. Design Build must be identified early in the process so design cost can be included.
- Contractors should be selected based upon their perceived ability to accomplish the project first with cost consideration being secondary on D/B projects.
- Do less technical specifications
- State the parameters on the functional requirements of the facility better.
- More collaboration between AFRC, COE and the General Contractor
- Meet with users to develop technical definitions and legitimate scope of all requirements before preparation of the RFP (bridging documents) by A-E

CHAPTER 5

CONCLUSION

When public construction projects miss their schedule goals and are over budget it attracts undesirable attention in the public and private sectors. AFRC continues to look for new ways to meet these schedule and budgetary requirements by selecting the best delivery methods available. Design Build has many attractive characteristics such as reduced cost and time, and an expected reduction in construction change orders, contractor claims, as well as a decrease in administrative costs and burdens and the possibility of transferring more of the risk from the government to the contractor. Based on the analysis of 87 facility Military Construction Projects between 1997-2007 my research shows that there has been no significant advantages to using the Design Build delivery method to execute AFRC facility vertical projects. The Defense Federal Acquisition Regulations (DFAR) mandates that the basis of Compensation for construction services to be firm fixed price. This directive probably negates the cost advantages that could be garnered with the Design Build delivery method. Contractor price uncertainties regarding requirements and specifications into their proposals as protection against unknowns later revealed under contract. The Design Build approach assumes that a substantial number of requirements have not yet been sufficiently addressed to proceed to construction. Asking the contractor to submit firm prices for the undeveloped requirements appears to be presumptuous. The Design Build delivery method had existed since before the pyramids however it is now only starting to emerge into society of modern business and litigation. The traditional Design Bid Build delivery method has been the tried and true method for a majority of the twentieth century. The

Design Build has received only a fraction of the scrutiny therefore the issue and risk are less understood. AFRC needs to establish standard requirements for each mission's facility needs or they will continue to struggle in appropriately implementing the Design Build delivery method.

Cost differences between Design Build and Design Bid Build can be directly linked to not having a clear project definition, RFP or scope of work prior to offering them for solicitation. Once a construction contract has been awarded, any change to the defined contract becomes a change order for both the traditional method of Design Bid Build and Design Build. Many times during the Design Build process the RFP entities do not know what they want, which becomes problematic to the delivery method. AFRC loses any flexibility. The contractor is forced to make changes to the design and everyone distrusts everyone else because all have different expectations for the process. Another reason for cost growth has been the lack of understanding fast-track execution. Many AFRC and COE Program Mangers (PM's) that were interviewed commented that most vertical facility Design Build projects do not follow the same delivery method systematic approach as that adhered to in the private industry. Once the contract has been award to the Design Build contractor another round of design is done by the Design Build team's Architect-Engineer (A/E). During this session with the Design Builder's A/E many problems begin to arise and cause tension between the parties. Even though Design Build is selected as the delivery method most Base Civil Engineering staff and even AFRC still want to have a 100% complete design before the first patch of dirt is turned.

It is clear from the statics of the first question on the questionnaire the perception of Design Build throughout the AFRC project delivery community and the lack of

adequate understand of the Design Build delivery process. The use of MATOC‘s will continue to be a topic of controversy as many survey participants still think this process eliminates the option of full and open completion. While AFRC and other federal agencies continue to promote the prescriptive based specifications over the performance based and still require firm fixed price over a best value alternative the Design Build delivery method will continue to disappoint in cost and schedule growth.

FURTHER RESEARCH

Further research on this topic could be conducted to define which is more important to the AFRC Command, cost or schedule growth. Is the Command willing to trade days in construction in order to control cost or are they willing to fund a higher cost of construction to meet targeted DIRTKICKER metrics? Although this thesis was limited to only AFRC MILCON projects comparisons to other federal agencies could offer a vision to possible alternative paths or it could validate the difficulty that all federal agencies face due to FAR and Congressional policies currently in place that govern the Design Build project delivery methodologies.

APPENDIX A

Questionnaire on Design Build in AFRC

Circle the letter beside the statement that you feel best answers the question.

1. *Which definition best describes Design Build for AFRC facility projects?*

   A. A delivery method where the government and a RFP A/E jointly prepare a design build Request for Proposals. The RFP includes the level of detail of project definition necessary to clearly define the elements of the design that AFRC wants to control. This approach requires offerors to submit no technical design solution and the only design required during the selection process is to establish the cost of the project.

   B. A procurement method for construction MILCON's that includes both design and construction.

   C. A procurement method used by AFRC to obligate construction funds because they have insufficient design dollars.

   D. No definition

2 *What is the main reason that AFRC uses the Design Build Delivery Method?*

   A. Obligate money quickly

   B. Provide a better savings (cost/schedule) to AFRC

   C. AFRC lend themselves to this method verse Design Bid Build

   D. Other

3. *Rate in order 1 to 5 (1 being the most) which of the following issues causes you the most problems for Design Build project delivery?*

   A. Lack of money (under programmed)

B. Not have a clear defined scope

C. Too many Base Standard requirements

D. Having to use SBA contracts

E. Lack of user input

4. *In your experience what is the most common Design Build Modification category?*

A. User Changes

B. Unforeseen site conditions

C. Host base changes (including ATFP)

D. Delays due to the government

5. *What is your delivery method of choice?*

A. Design Bid Build

B. Design Build

6. *Rate the following benefits of Design Build (First to Last)*

A. Collaboration

B. Lower cost

C. Fixed price

D. Faster Schedule

E. Reduced litigation and contract modifications

F. Reduced administrative burden

G. Reduced design time and cost

7. *Do you believe most building and construction people in AFRC see Design Build as a fast-track version of Design Bid Build?*

   A. Yes

   B. No

8. *In your opinion do the Multiple Award Task Order Contractors (MATOC) understand the Design Build process?*

   A. Yes

   B. No

   C. Not Sure

9. *In your opinion does AFRC discourage general contractor participation with excessive prescriptive requirements in the Request for Proposals?*

   A. Yes

   B. No

   C. Not Sure

10. *What is your estimate for the number of modifications for a typical AFRC Design Build project?*

   A. 0-7

   B. 7-10

   C. 10-15

   D. None (that is reason for Design Build)

11. *For AFRC Design Build projects what is your estimate of the number of construction schedule growth days compared to the original contract days?*

   A. None

B. 1-50 days

C. 50-100 days

D. 100-150 days

E. 150-200 days

12. *From your perspective which of the following percentage ranges for construction schedule growth would attribute to modifications in AFRC Design Build execution.*

A. None

B. 10-25%

C. 25%-45%

D. 45%-65%

13. Do you think that the Design Build delivery method provides AFRC with construction cost savings?

A. Yes

B. No

C. Not Sure

14. If you could change anything about how AFRC executes the Design Build deliver method, what would it be?

APPENDIX B

AFRC MILCON CONSTRUCTION SCHEDULE COST GROWTH 1997-2007

Program Avenue: MCP

FY	Project Title	PA	Act Awd Date	Dsn Met	Est Cns Compl Dt	Act Cns Compl Dt	Orig Contr Amt	Cur Contract Amt	% Cst Incr	Mod Day	Ctr Day	% SCH Incr	# Mod
97	BC- PARARESCURE TRAINING FAC	$2,650,000	30-Sep-97	T	5-May-99	24-Jul-99	$3,027,437	$3,074,656	**1.6**	80	365	**21.9**	7
	BC-ALTER FOUR MISC SHOPS	$500,000	19-Sep-97	T	30-Apr-99	19-Jun-99	$320,000	$325,008	**1.6**	50	245	**20.4**	2
	BC-ALTER COMBAT CAMERA	$1,200,000	29-May-97	T	6-Feb-98	13-Mar-98	$494,442	$599,201	**21.2**	35	210	**16.7**	7
	FIRE TRAINING FACILITY	$2,500,000	30-Dec-96	T	26-Oct-97	18-Feb-99	$2,090,000	$2,106,133	**0.8**	780	300	**260.0**	1
	UPGRADE STORM DRAINAGE SYSTEM	$1,150,000	27-Sep-97	T	15-Sep-98	15-Oct-98	$773,000	$890,449	**15.2**	30	330	**9.1**	1
	WING HEADQUARTERS FACILITY	$5,300,000	30-Dec-96	T	15-Dec-98	28-May-98	$4,714,700	$4,714,700	**0.0**	0	540	**0.0**	0
	MEDICAL TRAINING/ADMIN	$2,300,000	12-May-97	T	22-Jun-98	18-Jun-98	$2,333,000	$2,347,174	**0.6**	0	360	**0.0**	2
	MEDICAL TRAINING FACILITY	$2,500,000	21-Mar-97	T	15-May-98	4-Jun-99	$2,011,750	$2,049,250	**1.9**	385	360	**106.9**	4
	IMPROVE STORM DRAINAGE SYSTEM	$950,000	30-Sep-97	T	15-Feb-99	30-Jun-99	$705,366	$705,366	**0.0**	135	300	**45.0**	0
	FUELS SYSTEMS MAINTENANCE HGR	$6,000,000	11-Mar-98	T	15-Jun-99	17-May-99	$6,100,000	$6,100,000	**0.0**	0	360	**0.0**	0
	FIRE TRAINING FACILITY	$1,500,000	30-Dec-96	T	2-Jul-98	18-Feb-99	$1,254,969	$1,254,969	**0.0**	231	300	**77.0**	1
	CONSOLIDATED MEDICAL TRAINING	$2,600,000	30-Sep-97	T	30-Dec-98	30-Dec-98	$2,401,027	$2,699,112	**12.4**	0	180	**0.0**	4
	CONSOLIDATED MAINTENANCE FAC	$3,600,000	12-Mar-97	T	24-Apr-98	29-May-98	$3,529,950	$3,529,950	**0.0**	35	360	**9.7**	0
	COMPOSITE MAINTENANCE FACILITY	$3,200,000	15-Nov-96	T	5-Mar-98	16-Jun-98	$2,877,859	$2,877,859	**0.0**	103	420	**24.5**	0
	BC-MUNITIONS STORAGE	$1,500,000	10-Jul-97	T	5-Jul-98	15-Oct-98	$1,192,379	$1,202,379	**0.8**	102	360	**0.0**	1
	AWACS MISSION	$3,400,000	1-Apr-97	T	15-Feb-98	29-May-98	$2,923,885	$2,923,885	**0.0**	103	285	**36.1**	0
	ADAL FACILITIES FOR CONVERSION	$5,700,000	16-Apr-97	T	14-May-98	6-May-99	$5,607,394	$5,607,394	**0.0**	357	365	**97.8**	0
	1997 Fiscal Year Total: $46,550,000 - 17 Projects						**(Averages)**		**3.3**			**42.7**	**1.8**
98	FIRE TRAINING FACILITY	$1,800,000	3-Aug-98	T	29-Jul-99	27-Apr-01	$1,546,434	$1,623,024	**5.0**	638	360	**177.2**	10
	CONSOLIDATED TRAINING FACILITY	$2,100,000	17-Sep-98	T	14-Jul-99	22-Jun-00	$1,479,650	$1,514,466	**2.4**	344	300	**114,7**	3
	RENOVATE BLDG 220 - HQ AFRES	$5,580,000	28-Sep-95	T	20-Jan-97	29-Mar-97	$6,331,000	$6,365,632	**0.5**	68	480	**14.2**	2
	CORROSION CONTROL FACILITY	$1,550,000	29-Jan-98	T	24-Apr-99	7-Apr-99	$1,530,198	$1,530,198	**0.0**	0	450	**0**	0
	BASE CIVIL ENGINEER COMPLEX	$8,913,000	20-Aug-98	DB	10-May-00	30-May-00	$7,928,100	$7,928,100	**0.0**	20	540	**3.7**	0
	ALTER MISCELLANEOUS MAINT FAC	$1,000,000	18-Dec-97	T	18-Dec-98	30-Dec-99	$842,000	$842,000	**0.0**	377	365	**103.3**	0
	AERIAL PORT TRAINING FACILTY	$4,200,000	17-Sep-98	T	3-Feb-00	13-Apr-01	$3,159,317	$3,159,317	**0.0**	435	415	**104.8**	0
	ADD/ALTER BASE SUPPLY	$2,800,000	18-Dec-97	T	15-Jun-99	15-Dec-99	$2,163,661	$2,163,661	**0.0**	183	365	**50.1**	0
	ADAL SQUAD OPS FACILITY	$1,400,000	18-Dec-97	T	15-Jun-99	30-Dec-99	$1,018,000	$1,018,000	**0.0**	183	365	**50.1**	0
	1998 Fiscal Year Total: $29,343,000 - 9 Projects						**(Averages)**		**0.9**			**55.9**	**1.7**
99	CONSOLIDATED MAINTENANCE FAC	$5,200,000	31-Mar-99	T	23-Feb-01	15-Jun-01	$4,396,000	$4,649,862	**5.8**	112	420	**26.7**	6
	RENOVATE VAQ 478	$4,600,000	1-Sep-99	T	21-Nov-00	21-Nov-00	$3,113,585	$3,113,585	**0.0**	0	390	**0.0**	0
	RENOVATE MAINTENANCE HANGAR 4	$5,200,000	19-Apr-99	T	12-Jun-00	5-Aug-03	$4,753,000	$4,753,000	**0.0**	1149	420	**273.6**	0
	PARARESCUE FACILITY	$1,400,000	28-Sep-00	T	23-Jul-01	20-Aug-01	$1,455,307	$1,455,307	**0.0**	28	270	**10.3**	0
	MUNITIONS HAND EQUIPT MAINT	$1,900,000	23-Jul-99	T	29-Nov-00	29-Nov-00	$1,688,354	$1,688,354	**0.0**	0	360	**0.0**	0
	CONSOLIDATED MEDICAL FACILITY	$3,400,000	27-Aug-99	T	23-Sep-00	23-Dec-01	$2,745,820	$2,920,920	**6.4**	456	360	**126.7**	17
	CONSOLIDATED MAINTENANCE FAC	$3,900,000	30-Jun-99	T	15-May-01	22-May-02	$3,031,400	$3,031,400	**0.0**	372	420	**88.6**	0
	CONSOLIDATED LODGING FAC PH 1	$3,236,000	11-Aug-99	T	1-Jun-01	5-Sep-01	$3,764,682	$3,764,682	**0.0**	96	540	**17.8**	0
	ALTER FAC FOR C-141 SIMULATOR	$1,600,000	25-Jan-99	T	10-Aug-99	3-Sep-99	$1,446,000	$1,521,911	**5.2**	24	180	**13.3**	14
	1999 Fiscal Year Total: $30,436,000 - 9 Projects						**(Averages)**		**1.9**			**61.9**	**4.1**

APPENDIX B
(continued)

AFRC MILCON CONSTRUCTION SCHEDULE COST GROWTH 1997-2007

Program Avenue: MCP

FY	Project Title	PA	Act Awd Date	Dsn Met	Est Cns Compl Dt	Act Cns Compl Dt	Orig Contr Amt	Cur Contract Amt	% Cst Incr	Mod Day	Ctr Day	% SCH Incr	# Mod
00	CONTROL TOWER	$4,250,000	28-Mar-00	T	16-Jan-02	9-Aug-02	$4,033,800	$4,064,240	0.8	205	631	32.5	6
	ADD/ALTER AFRC HQ & ATACC	$14,000,000	22-Sep-00	DB	11-Dec-03	28-Jul-04	$13,519,500	$14,939,071	10.5	117	999	11.7	6
	AERIAL PORT TRAINING FACILITY	$800,000	28-Feb-00	T	25-Jan-01	18-Apr-01	$774,400	$800,146	3.3	21	321	6.5	12
	LODGING FACILITY	$6,300,000	29-Jun-00	T	10-Mar-02	30-May-02	$6,233,032	$6,233,032	0.0	20	615	3.3	0
	LODGING AND DINING HALL	$10,800,000	28-Sep-00	DB	13-Aug-02	18-Jul-03	$9,742,900	$9,742,900	0.0	339	660	51.4	0
	FIRE TRAINING FACILITY	$2,000,000	27-Jun-00	T	23-Apr-01	31-Aug-01	$1,892,000	$1,892,000	0.0	130	300	43.3	0
	FIRE STATION	$2,950,000	30-Oct-00	T	30-Dec-01	30-Nov-02	$2,666,500	$2,666,500	0.0	335	426	78.6	0
	DEICING RECOVERY PAD	$3,400,000	28-Sep-00	NULL	22-Nov-01	22-Nov-01	$1,948,400	$1,948,400	0.0	0	270	0.0	0
	CONSOLIDATED LODGING FAC PH 2	$8,140,000	30-Mar-00	T	3-Oct-01	3-Oct-01	$7,456,000	$7,456,000	0.0	0	600	0.0	0
	C-17 ADAL SQ OPS FAC	$3,300,000	30-Mar-00	T	25-Feb-02	4-Apr-02	$2,912,800	$2,912,800	0.0	38	575	6.6	0
	ADAL FACS FOR C130H AIRCREW TG	$2,130,000	29-Sep-00	T	11-Dec-01	17-Jun-03	$2,319,934	$2,319,934	0.0	553	400	38.3	0
	2000 Fiscal Year Total: $58,070,000 - 11 Projects						**(Averages)**		1.3			24.7	2.2
01	ADAL FIRE STATION, PHASE II	$2,000,000	4-Mar-01	T	15-Apr-03	14-Feb-04	$1,691,000	$1,691,000	0.0	305	333	91.6	0
	ALTER HANGAR AND ADD AFFF	$2,400,000	14-Sep-01	T	12-Aug-02	30-Sep-03	$2,125,000	$2,125,000	0.0	414	330	25.5	0
	C-130 ASSAULT STRIP	$5,951,000	24-Aug-01	T	23-Sep-02	12-Jun-03	$5,839,880	$5,839,880	0.0	262	360	72.8	0
	SERVICES COMPLEX PHASE 2	$11,290,000	21-Sep-01	T	15-Jun-03	9-Feb-04	$10,192,305	$10,192,305	0.0	239	450	53.1	0
	SMALL ARMS MUNITIONS STORAGE	$700,000	8-Aug-94	T	2-Dec-95	2-Dec-95	$504,599	$504,599	0.0	0	450	0.0	0
	REPAIR/ALTER AIRMAN QUARTERS	$7,450,000	3-Aug-01	T	8-Dec-02	19-May-03	$6,687,700	$6,984,446	4.4	129	450	28.7	6
	2001 Fiscal Year Total: $29,791,000 - 6 Projects						**(Averages)**		0.7			45.3	1
02	C-130J MAINTENANCE HANGAR	$12,000,000	28-Mar-02	DB	14-Apr-04	23-Jun-04	$8,936,000	$9,031,590	1.1	161	720	22.4	8
	ADD/ALTER AFRC HQ & ATACC	$2,000,000	29-Mar-02	DB	9-Apr-04	28-Jul-04	$1,347,535	$1,890,595	40.3	67	738	9.1	8
	Services Comples - Dormitory	$13,200,000	28-Jun-02	T	20-Oct-04	15-Dec-04	$10,263,000	$10,263,000	0.0	56	540	10.4	0
	FUEL CELL MAINTENANCE HANGAR	$7,300,000	16-Aug-02	T	6-Jul-04	7-Feb-05	$4,905,593	$4,905,593	0.0	216	690	31.3	0
	CONSOLIDATED LODGING PH 3	$8,400,000	3-May-02	T	26-May-03	16-Oct-03	$7,734,000	$7,734,000	0.0	143	360	39.7	0
	AIRCRAFT MAINTENANCE HANGAR	$9,900,000	16-Aug-02	T	6-Jul-04	6-Mar-05	$7,424,207	$7,424,207	0.0	243	690	35.2	0
	ADD/ALTER SQUAD OPS FACILITY	$1,400,000	30-Sep-02	T	12-Jun-03	27-Feb-04	$1,547,615	$1,547,615	0.0	230	300	76.7	0
	ADD/ALTER COMM CENTER	$2,000,000	21-Sep-02	T	29-Nov-03	4-Nov-04	$1,825,788	$1,825,788	0.0	341	360	94.7	0
	2002 Fiscal Year Total: $56,200,000 - 8 Projects						**(Averages)**		5.2			39.9	2
03	SECURITY FORCES OPERATION	$3,850,000	25-Sep-03	DB	30-Jul-05	2-Mar-06	$3,759,000	$3,794,638	0.9	128	720	17.8	6
	SERVICES TRAINING FACILITY	$2,500,000	9-Sep-03	T	18-Nov-04	12-Mar-05	$2,780,000	$2,780,000	0.0	114	360	31.7	0
	MEDICIAL TRAINING ADDN	$2,150,000	27-Jun-03	DB	20-Aug-04	30-Jun-04	$1,867,582	$1,867,582	0.0	0	311	0	0
	Hydrant Refueling System and Parking Overl	$6,400,000	29-Aug-03	T	12-Oct-04	15-Mar-06	$5,770,000	$5,770,000	0.0	519	450	115.3	0
	ENTRANCE F.P. - VISITOR CENTER	$2,000,000	19-Sep-03	T	18-Nov-04	12-Jul-05	$2,094,644	$2,094,644	0.0	236	360	65.6	0
	Cosolidated Space Group Operations	$6,900,000	5-Sep-03	DB	1-Jun-05	14-Feb-05	$6,317,225	$6,317,225	0.0	0	450	0	0
	Consolidated Training Phase 1	$1,609,000	12-Aug-03	T	10-Sep-04	13-Jul-06	$1,573,567	$1,573,567	0.0	0	365	0	0
	Consolidated Lodging Facility	$6,300,000	25-Feb-04	T	15-May-04	15-Jun-05	$3,391,109	$3,391,109	0.0	671	360	186.3	0
	CONST INSTLTN PERIMETER FENCE	$1,100,000	15-Aug-03	DB	8-May-04	9-Jun-04	$1,020,276	$1,020,276	0.0	396	210	188.6	0
	C-17, ALTER CO-LOCATED LIFE SUPPOR	$3,000,000	17-Sep-03	T	29-Sep-04	14-Jun-05	$2,925,088	$2,925,088	0.0	32	360	8.9	0
	C-17 MAINTENANCE & INSPECTION HANG	$15,100,000	31-Jul-03	DB	28-Feb-05	23-May-05	$11,227,018	$11,411,703	1.6	84	540	15.6	3
	C-17 Alter Squadron Operations Facility	$1,700,000	29-Aug-03	T	26-Jun-04	1-May-04	$1,608,877	$1,608,877	0.0	0	360	0	0
	C-17 ALTER GEN MAINT SHOPS	$2,000,000	14-Aug-03	T	29-Aug-04	27-Sep-05	$2,418,345	$2,418,345	0.0	394	360	109.4	0
	C-17 ALTER FLIGHT SIMULATOR FACILIT	$1,900,000	2-Sep-03	T	16-Aug-04	14-Aug-04	$1,669,645	$1,727,182	3.4	0	300	0	2
	Alter Maintenance Hangar	$525,000	12-Aug-03	T	15-Sep-04	13-Jul-06	$394,145	$394,145	0.0	666	365	182.5	0
	Alter Maintenance Facilities	$2,650,000	12-Aug-03	T	15-Sep-04	13-Jul-06	$2,697,246	$2,697,246	0.0	666	365	182.5	0
	2003 Fiscal Year Total: $59,684,000 - 16 Projects						**(Averages)**		0.4			69.0	0.3

APPENDIX B
(continued)

AFRC MILCON CONSTRUCTION SCHEDULE COST GROWTH 1997-2007

Program Avenue: MCP

FY	Project Title	PA	Act Awd Date	Dsn Met	Est Cns Compl Dt	Act Cns Compl Dt	Orig Contr Amt	Cur Contract Amt	% Cst Incr	Mod Day	Ctr Day	% SCH Incr	# Mod
04	CNST S. COBB DRIVE OVERPASS	$4,200,000	24-Sep-04	T	3-Oct-05	22-Nov-06	$4,800,000	$4,579,665	**-4.6**	224	360	**62.2**	12
	FUEL CELL MAINTENANCE HANGAR	$6,650,000	29-Dec-03	DB	13-Aug-05	12-Feb-06	$5,888,960	$5,888,238	**0.0**	235	540	**43.5**	4
	UPGRADE AIRFIELD APRON PAYMENTS F	$835,000	31-Dec-03	T	30-Nov-04	17-Dec-04	$468,000	$484,600	**3.5**	17	167	**10.2**	1
	Hydrant Refueling System Phase 2	$3,050,000	19-Dec-03	T	24-Dec-04	15-Mar-06	$2,138,000	$2,138,000	**0.0**	446	360	**123.9**	0
	Fire/Crash Rescue Station	$4,330,000	30-Jan-04	T	31-Dec-04	15-Jun-05	$4,511,466	$4,511,466	**0.0**	166	365	**45.5**	0
	Construct AES Building	$3,650,000	9-Aug-04	T	22-Sep-05	22-Sep-05	$3,583,000	$3,583,000	**0.0**	0	360	**0.0**	0
	CONSTRUCT FUEL HYDRANT SYSTEM FC	$7,375,000	29-Sep-04	T	11-Jan-06	25-Apr-07	$7,940,400	$8,088,574	**1.9**	469	540	**86.9**	11
	Alter Flightline Facilities	$2,900,000	26-Aug-04	T	19-May-05	24-Apr-06	$2,958,638	$2,958,638	**0.0**	340	365	**93.2**	0
	ALTER AIRCRAFT MAINTENANCE SHOPS	$2,900,000	31-Dec-03	T	12-Oct-04	17-Dec-04	$1,339,000	$1,426,973	**6.6**	66	167	**39.5**	16
	AERIAL PORT/AIRLIFT CONTROL	$7,700,000	24-Sep-04	DB	24-Feb-06	13-Jan-06	$7,315,000	$7,315,000	**0.0**	0	499	**0.0**	0
	2004 Fiscal Year Total: $43,590,000 - 10 Projects						**(Averages)**		**0.7**			**50.5**	**4.4**
05	BASE OPERATIONS	$4,400,000	28-Jul-05	DB	29-Aug-06	NULL	$3,972,868	$4,069,873	**2.4**	442	365	**121.1**	14
	C-5 TRAINING LOAD ASSEMBLY FACILITY	$2,510,000	30-Sep-05	T	10-Apr-06	27-Jan-07	$2,253,678	$2,282,678	**1.3**	206	245	**84.1**	22
	ADD/ALTER FACILITY FOR C-5 AIRCRAFT	$1,900,000	30-Sep-05	T	10-Apr-06	27-Jan-07	$1,626,655	$1,620,555	**-0.4**	206	245	**84.1**	25
	C-5 TRAINING SCHOOLHOUSE COMPLEX	$20,000,000	20-May-05	T	15-Sep-06	3-Jan-07	$16,055,000	$16,666,765	**3.8**	108	457	**23.6**	42
	C-5 MULTIPURPOSE HANGAR	$16,821,000	31-May-05	T	13-Oct-06	NULL	$16,581,000	$16,821,046	**1.4**	75	540	**13.9**	15
	Upgrade Maintenance Bays	$10,000,000	19-Sep-05	DB	13-Jan-07	20-Apr-07	$10,566,000	$10,531,000	**-0.3**	97	540	**18.0**	4
	RESERVE SECURITY FORCES OPERATIO	$2,300,000	20-May-05	T	2-Feb-06	25-May-06	$2,331,165	$2,331,165	**0.0**	112	330	**33.9**	0
	INSTALL PHOTO-VOLTAIC ARRAY	$3,631,000	28-Sep-05	T	15-Dec-07	30-Jan-07	$3,308,772	$3,308,772	**0.0**	46	360	**12.8**	0
	FIRE/CRASH RESCUE STATION	$7,800,000	26-Sep-06	T	13-Feb-07	28-Aug-08	$7,870,000	$7,870,000	**0.0**	562	540	**104.1**	0
	Construct Security Forces	$4,950,000	30-Sep-05	T	15-Jan-07	NULL	$5,280,013	$5,280,013	**0.0**	762	600	**127.0**	0
	Consolidated Training Facility Phase 2	$3,800,000	15-Feb-05	T	31-Jan-06	17-Jul-06	$3,499,873	$3,499,873	**0.0**	167	540	**30.9**	0
	CONSTRUCT AIRCRAFT PARTS STORE	$1,850,000	8-Jul-05	DB	1-Jun-06	1-Sep-06	$1,855,298	$1,855,298	**0.0**	92	345	**26.7**	0
	C-5 AIRFIELD PAVEMENT, PH-1	$4,300,000	11-Mar-05	T	7-Oct-05	10-Nov-05	$3,980,000	$3,907,035	**-1.8**	34	190	**17.9**	9
	C-17 MAINTENANCE HANGAR PHASE 2	$7,400,000	17-Jun-05	DB	10-Sep-06	12-May-08	$6,757,324	$6,757,324	**0.0**	610	450	**135.6**	0
	C-17 ALTER HANGAR TOWERS	$2,089,000	17-Jun-05	T	13-May-06	15-May-06	$1,516,175	$1,516,175	**0.0**	0	330	**0.0**	0
	B-52 SQUADRON OPERATIONS	$4,800,000	11-May-06	DB	30-Aug-06	25-Sep-07	$4,637,900	$4,637,900	**0.0**	391	410	**95.4**	0
	ADD/ ALTER FITNESS CENTER	$4,400,000	30-Sep-05	T	15-Jun-07	24-Aug-07	$4,385,121	$4,385,121	**0.0**	70	547	**12.8**	0
	2005 Fiscal Year Total: $102,951,000 - 17 Projects						**(Averages)**		**0.4**			**55.4**	**7.7**

APPENDIX B
(continued)

AFRC MILCON CONSTRUCTION SCHEDULE COST GROWTH 1997-2007

Program Avenue: MCP

FY	Project Title	PA	Act Awd Date	Dsn Met	Est Cns Compl Dt	Act Cns Compl Dt	Orig Contr Amt	Cur Contract Amt	% Cst Incr	Mod Day	Ctr Day	% SCH Incr	# Mod
06	INSTALL PHOTO-VOLTAIC ARRAY, Phase	$1,000,000	10-Mar-06	T	15-Dec-07	30-Jan-08	$1,050,000	$1,050,000	0.0	46	200	23.0	0
	JT SERVICES LODGING FACILITY	$7,425,000	17-Aug-06	DB	30-Mar-08	15-Dec-08	$7,473,000	$7,473,000	0.0	260	540	48.1	0
	VISITING QUARTERS PHASE 1	$9,120,004	1-Jun-06	T	16-Jan-08	5-Aug-08	$8,406,000	$8,406,000	0.0	202	540	37.4	0
	RAPCON	$6,939,133	21-Apr-06	T	20-Oct-07	18-Mar-08	$5,027,500	$5,748,500	14.3	150	540	27.8	1
	C-5 SCHEDULED MAINTENANCE HANGAF	$15,166,961	27-Mar-06	T	18-Sep-07	18-Sep-08	$14,927,000	$15,135,864	1.4	366	540	67.8	8
	Add/Alter Pararescue Facility	$1,500,000	16-Mar-06	DB	10-Apr-07	23-Oct-08	$1,351,141	$1,379,934	2.1	562	390	144.1	2
	C-5 FUEL SYSTEM MAINTENANCE HANG/	$10,395,000	29-Sep-05	DB	23-Mar-07	3-Sep-08	$9,673,500	$9,935,517	2.7	530	510	103.9	7
	MUNITIONS STORAGE COMPLEX	$2,970,000	23-May-06	T	22-Jun-07	9-Nov-07	$3,291,950	$3,385,103	2.8	140	350	40.0	7
	Enclose Small Arms Range	$3,000,000	27-Sep-07	T	15-Oct-08	28-Sep-08	$2,316,775	$2,316,775	0.0	0	360	0.0	0
	COMPOSITE AND MEDICAL TRAINING FA(	$6,393,916	28-Sep-06	T	2-Aug-07	15-Apr-08	$6,345,205	$6,345,205	0.0	257	540	47.6	0
	CIVIL ENGINEERING COMPLEX	$5,841,000	5-Sep-06	DB	15-Feb-08	31-Dec-08	$5,489,000	$5,489,000	0.0	320	520	61.5	0
	C-5 AIRFIELD PAVEMENT PH-2	$4,356,000	28-Mar-06	T	3-Mar-07	7-Dec-06	$3,556,000	$3,556,000	0.0	0	340	0.0	0
	C -5 SQUADRON OPERATIONS	$5,700,002	27-Feb-06	T	5-May-07	7-May-08	$4,912,465	$4,912,465	0.0	0	360	0.0	0
	ALTER MAINTENANCE SHOPS	$793,044	31-Mar-06	T	14-Feb-07	2-Jul-08	$796,461	$796,461	0.0	505	360	140.0	0
	ALTER FLIGHT SIMULATOR FACILITY	$792,000	23-Jun-06	T	26-Jan-06	2-Jul-08	$437,451	$437,451	0.0	444	296	150.0	0
	AIRCRAFT GENERATION FACILITY	$1,733,000	28-Nov-06	DB	27-Jul-07	30-Nov-07	$1,762,000	$1,762,000	0.0	126	365	34.5	0
	ADD/ALTER 920 RQW OPS FACILITIY B69(	$2,071,827	31-Mar-06	T	1-Jul-07	14-Dec-07	$1,969,000	$1,969,000	0.0	166	450	36.9	0
	2006 Fiscal Year Total: $85,196,887 - 17 Projects						**(Averages)**		1.4			56.6	1.5
07	BRAC AFR EXPAND FUEL HYDRANT SYST	$1,800,000	11-Jul-07	DB	21-Nov-07	22-Aug-08	$1,857,645	$1,962,847	5.7	0	395	0.0	1
	BRAC AFR AIRCRAFT MAINTENANCE SQ(	$1,750,000	26-Sep-07	T	25-Sep-08	6-Nov-08	$1,485,000	$1,485,000	0.0	42	365	11.5	0
	BRAC AFR ADD-ALTER SQUADRON OPEF	$1,950,000	26-Sep-07	T	21-May-08	13-Nov-08	$2,228,788	$2,228,788	0.0	49	365	13.4	0
	2007 Fiscal Year Total: $5,500,000 - 3 Projects					**(Averages - consolidated)**			1.90			8.30	0.3
	Program Avenue Grand Total: $626,747,887- 147 Projects							**Cost**	2.3%	**Sch / Mod**		45.1%	5

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